

THE TAXONOMY AND IDENTIFICATION OF PIPITS (genus *Anthus*)

BY

B. P. HALL



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INTRODUCTION

THE difficulties of distinguishing the different species of pipit, both in the hand and in the field, are well known. While the standard handbooks for different countries deal with identification of the various forms in their own areas, little attempt has been made to define the characters and relationships throughout the world. Unfortunately lack of adequate field experience of pipits precludes me from discussing this aspect, but the collection of over 2,000 skins in the British Museum, supplemented by loans of critical specimens from elsewhere, has enabled me to study all species in the hand, with particular emphasis on those Old World species that present most difficulty in recognition. From that study this paper has been compiled in order to help others to identify pipits and to understand better the relationship between the different species.

The first part deals with an analysis of the diagnostic usefulness and limitations of five important characters—colour and pattern (with particular reference to changes caused by moult and wear), size, conformation of the hind claw, tail pattern, and wing formula. These characters have been selected for specific identification, though this does not imply that there are no others. In identifying the majority of pipits all five should be used in conjunction, and the evidence of the eye in respect of colour and pattern should be backed by measurements and comparison of tails, wings and claws. Since no one character is wholly diagnostic, and all are liable to occasional misinterpretation, no "Key to Species" has been made, for doubt and error would always be liable to intrude in its use. Furthermore, it is inevitable in any key that more stress is laid on the characters first used to subdivide a group than on subsequent characters, which gives them an exaggerated importance. I find it impossible also to subdivide the genus on a systematic basis without overstressing the importance of one or other character, and propose instead to divide it into three groups which may facilitate identification.

Group A includes fourteen species of Old World and Australasian pipits all of which have a typical pipit-like appearance and a wide range, and therefore present most problems in identification. The measurements of all species in this group are listed together in Table 2-9 for easy comparison and all are illustrated by photographs and by sketches of their tail patterns, wing tips and hind claws. Any typical Old World pipit should be compared with these plates and then checked with the text and the tables of measurement.

Group B comprises two Asian, eight African and one Australasian species which, through some distinctive feature in colour, pattern or size, are unlike the typical pipits of Group A. Most of them have a restricted distribution and offer few problems of identification to anyone with the appropriate regional handbook. They are not illustrated but their characters are outlined under the same formula as is used in Group A for easy comparison, with a final summary of their distinctive features.

Group C comprises ten exclusively American or South Atlantic species. Lack of extensive material has prevented these being studied as fully as the Old World pipits, but they also have their characters outlined as in Group B.

While this study is chiefly concerned with specific characters, subspecific variation cannot wholly be ignored and therefore some of the difficulties of subspecific

definition and recognition have been discussed. Under each species geographical variation is outlined but the ranges and characters of individual races are defined only when they are relevant to the discussion, or in the few cases in which I disagree with currently accepted views.

Since this paper was completed Volume 9 of the *Check-List of Birds of the World* has been published. This contains the systematic list of the family Motacillidae with full references to all subspecies and to many names considered synonyms. It seems therefore superfluous to list these again here, but I have listed in the Appendix all amendments proposed in this paper to that systematic list.

THE DIAGNOSTIC USEFULNESS AND LIMITATIONS OF CERTAIN CHARACTERS

Colour and Pattern, and the Effects of Moulting and Wear

In appearance the majority of pipits vary only in the basic shade of brown above, the whiteness or buffiness below, and in the degree of streaking above and below. Furthermore, since pipits have a soft plumage, noticeably softer for instance than that of larks, and many spend much of their time on the ground or in grass, there is considerable seasonal wear as a result of which some differences of colour and pattern become lost. To off-set this wear and abrasion many species have a partial or a complete spring moult which may, or may not, be into a distinctive breeding dress. The completeness of this moult may vary within populations of the same species as Mayaud (1952) has shown in his study of the European Rock Pipits; in these the apparent differences between the spring plumages of the Scandinavian and British populations are due to the former having a more complete moult.

It is not generally appreciated that some other species have a haphazard partial moult during the winter months, of body feathers, rectrices, innermost secondaries, wing coverts and, occasionally, primaries. This moult has been observed in Richard's Pipit, *A. novaeseelandiae*, the Tawny Pipit, *A. campestris*, and Blyth's Pipit, *A. godlewskii*; it has been studied chiefly in the migrant Asiatic races of Richard's Pipit (*A. n. richardi* subsp.) for in these races the breeding season is limited to a few weeks in mid-summer and it is therefore possible to limit the date of post-breeding moult within a short period. Moreover there are abundant winter specimens of this pipit available. An analysis of the moults in two hundred and sixty-eight specimens collected from October to May shows that moult in the primaries is more prevalent in birds which reach furthest south, the examples examined, being from Ceylon (5 specimens), Andaman Islands (2), Madras (1), Siam (3), Laos (1), and Bengal (1 on migration, 24th April). This suggests that the moult has a functional usefulness in replacing worn feathers prior to a long journey and may be developing in the course of evolution as an efficient character increasing the survival chances. Where there is moult in the primaries it is symmetrical in both wings, complete and in sequence, but otherwise there seems no regular sequence to the winter moult: in different specimens central rectrices have been found coming in before, after, and concurrently with other rectrices: moult may be found in body, wings and tail alone, or in all three together, or in any two alone.

Post-breeding moult in *A. n. richardi* subsp. takes place in July and August, or early September at the latest: I have found no indication that it is other than a normal complete moult. The following table (Table I) shows the percentage of specimens examined in which moult in different parts of the body is taking place in the winter; it suggests that, in some birds, some feathers may be moulted three times a year, and there are three peak moulting seasons, in July, December and March-April.

These figures are based only on specimens in which actual feathers in sheath have been found. As these feathers are frequently lost in skinning the number of specimens in moult at the time of collecting is probably higher than indicated.

TABLE I.—*Haphazard Winter Moult in A. n. richardi subsp. (% to nearest whole)*

	Month							
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apl.	May
	23	33	39	44	39	31	29	30
Number of specimens								
Moult of body, wing-coverts or secondaries	21%	57%	66%	39%	35%	87%	89%	53%
Moult of central rectrices	17%	12%	28%	7%	18%	45%	14%	—
Moult of other rectrices	8%	8%	10%	2%	7%	29%	20%	10%
Moult of primaries	10%	—	6%	2%	2%	16%	14%	—
Total showing moult in some part, or parts	35%	57%	72%	38%	41%	87%	89%	53%

It will be appreciated therefore from the examples of the Rock Pipit and Richard's Pipit how important an understanding of moult can be in making comparisons of colour and pattern in pipits, and only birds collected in the same month and in the same condition of plumage should be used. In all species of Group A I have indicated where possible what moults are to be expected but in many species of Groups B and C too few specimens are available on which to generalize, and too little is known of the breeding seasons.

In describing the plumages it is difficult to express some of the differences in colour and pattern. For the basic colour of the upper parts I have used the term "tawny brown" to indicate a light, sandy shade such as is characteristic of the Tawny Pipit, *A. campestris*; "light brown" for a less sandy tone; "olive-brown" for a greener brown; and "dark brown" or "chocolate" for the darker tones; but these terms, must, inevitably, cover a wide range of individual variation.

In defining the amount of pattern on the breast I have used the terms "streaking" and "spotting" to differentiate between the species which have true streaks and those which, like *A. novaeseelandiae*, have the streaks reduced to small triangular marks.

The term "scalloping" has been used for the effect caused by white or light edges to the mantle feathers, which is found in some young birds.

Size and Measurements

The uniformity in size among pipit species enhances the value of small differences

in proportions, and the usefulness of detailed measurements is readily apparent in the various tables that have been compiled: this usefulness, unfortunately, is limited to a large extent by human inconsistency in measuring, particularly in the dried skin. This does not apply to wing measurements of small birds like pipits in which little or no variation will be found between the figures arrived at by two careful measurers on the same series. I believe, however, that the range of wing measurements for any form based on a series of skins, will always be found to be a trifle smaller than the range based on live birds handled in ringing, due to some shrinkage of the wing in drying. Tails, in the dried skin, present a greater difficulty and an experiment carried out with four experienced measurers, on tails between 60 and 80 mm., showed a degree of variation up to 5 mm., due wholly to the degree of pressure exerted in fitting the tip of the dividers into the angle where the central rectrices join. On a re-trial each measurer was found to obtain consistent results in his or her technique. This individual variability obviously detracts from the value of published tail measurements but they have been included since specimens measured by the same hand are useful comparatively and the variation is limited. However it should be borne in mind when consulting the table that I am among those who give shorter measurements than some others. There is a further difficulty with the wings and tails of pipits for, due to wear, the feathers are rarely wholly perfect especially among birds that are on their breeding grounds. Since it is only these birds that are useful in studying geographical variations they must be used but some judgment is needed to determine which are too worn for inclusion in measurement tables.

Bill measurements made with different quality dividers may show a difference of 0.5 mm.: all quoted in this paper have been taken from the base of the skull using a fine-pointed pair. Tarsus measurements are dependent on the make-up of the skins but the degree of possible error is limited.

These difficulties are stressed here since it is important that the "Tables of Measurements" shall be used with discretion and understanding for identification.

Conformation of the Hind Claw

The length and shape of the hind claw is one of the most reliable aids to specific identification but the limitations must also be understood. Firstly there is in all species some individual variation in length and curvature, which is indicated in the text by the measurements for each form and in the species figured. To this is added some geographical variation, particularly among the ground species, due possibly to populations living on harder or softer ground. In all species odd specimens may also be found occasionally with stubby claws, due to some deformity or accident, and these have not been included in the measurements: similarly occasional specimens may be found with exceptionally long claws in which the tapered tip, which is very fine and delicate, has not worn down as much as usual.

Tail Pattern

The pattern of white in the tail is another aid to identification within the limits

imposed by individual variation. In nearly all species the greater part of the outermost pair of rectrices is white, and specific differences are not obvious, I have therefore concentrated entirely on the pattern in the second outermost pair. In all species this pattern will be found to vary individually but always within strict limits, which have been illustrated. While it is never possible on tail pattern alone to say to which species a pipit belongs, it is usually possible to name a number to which it does not belong.

There is some variability in the clearness of the tail pattern, some species having it always pure white, in others it is always dusky white or buff, in others, such as *A. spinoletta*, it varies racially. Too much reliance should not be placed on this colour variation in single specimens since it is frequently difficult to distinguish a pure white pattern that has become dirty through soil-staining, from one that was dusky white originally. Also in old plumage the pure white loses some of its purity, while dusky white tends to bleach.

Wing Formula

The wagtails and pipits have a distinctive wing noteworthy for the length of the inner secondaries which, in fresh plumage, often equal the longest primaries. They are among the group of passerines that have nine primaries, but the outermost primary is so small as to escape notice. For this reason it has become customary in many text books to ignore this feather and to refer to the outermost fully-developed primary as the first. To avoid confusion I have followed this custom.

Variation in the wing formula and in the number of emarginated primaries in the pipits has been cited as a useful aid to specific identification. While recognizing fully this usefulness I do not believe that too much stress should be laid on this character as a guide to relationship, since Savile (1957) has shown that the wing is one of the avian features most readily adapted in the course of evolution to special requirements, and it is therefore as likely to illustrate convergence as relationship. This adaptability is borne out well in the pipits and, at the same time, they illustrate that more pointed wings are the most efficient for long migrations; even within a species slight variation in shape can usually be correlated with the distance that birds of different races migrate. For example the two pipits with the most pointed wings are the Pechora Pipit, *A. gustavi*, and the European race of the Tree Pipit, *A. t. trivialis*; in both these forms the wing tip is composed only of the first three primaries with the fourth at least 4 mm. shorter. They are, respectively, the only Palaearctic migrants to reach as far south as the Moluccas and South Africa. On the other hand the Himalayan race of the Tree Pipit, *A. t. haringtoni*, which does not move further than the north Indian plains, has a blunter wing with the fourth primary less than 3 mm. shorter than the third.

In more than half the other species the first four primaries form the wing tip with the fourth not more than 2 mm. shorter than the third. These species include all the other migrant Palaearctic forms and some of the resident forms of Africa, Asia, the Americas and Australasia. The remaining species are blunt-winged with the first five primaries forming the wing tip. None of these is a true migrant though some forms may move locally.

Emargination is found on the second and third, and sometimes on the fourth and fifth primaries. It is invariably correlated to the length of the feather so that in the pointed wings, in which the fourth primary is short, only the second and third are emarginated, whereas in the blunt wings, in which the first five primaries are nearly equal, the second to fifth are all emarginated.

In describing the wing formula I have used the term "sub-equal" of a group of primaries that are nearly equal in length but in which the relative lengths vary slightly in different individuals.

JUVENILE PLUMAGE

Two distinct types of juvenile plumage are found among the pipits. In many species the juvenile feathers of the upper parts are edged with white, giving a scalloped effect. A few of these feathers are often retained for some months, especially in the wing coverts, so that first winter birds can usually be recognized. In the other species there is no light edging to the feathers and the juveniles are very similar to the adults: in most of these species there is no way of distinguishing between first winter birds and adults.

In Group A a brief description of the juvenile plumage of all species is given as an aid to identification, but, through lack of young birds of many species, it has not been described in Groups B and C.

SUBSPECIFIC VARIATION, DEFINITION AND IDENTIFICATION

There is possibly more controversy on the number of recognizable subspecies in *Anthus* than in any other genus of comparable size. There are several reasons for this but perhaps the greatest is the difficulty of obtaining birds in fresh plumage actually on their breeding grounds. The only certain residents of any area are birds actually breeding, and these, as has already been noted, are highly unsatisfactory for either colour comparison or measurement, because of the wear in the plumage, so that, while varieties may be seen to exist in non-breeding birds, their ranges are hard to define. Outside the breeding season much remains to be learnt of pipit movements: some forms are true migrants, others are subject to small altitudinal local movements, others move locally in association with the rains: there is thus no certainty that any freshly moulted bird is still on its breeding ground.

Another difficulty in the determination of pipit subspecies is that of micro-populations, or ecological variations. Pipits, through their cryptic coloration, are particularly susceptible to variation under different ecological conditions. Thus micropopulations are found in limited areas recognizable from their immediate neighbours but not necessarily from populations living in approximately the same conditions some distance away. Examples of this can be found in the dark populations of *A. novaeseelandiae* found on mountains in central Africa and Asia, and very bleached populations associated with the limestone pans such as the Etosha and Makarikari Pans of southern Africa. On a larger scale all desert populations are, as would be expected, paler than those from wetter areas.

In deciding which of these varieties can be accepted as subspecies one is confronted by the unsatisfactory character of a subspecies as a taxonomic unit. If its definition is to be accepted as "geographically defined aggregates of local populations which differ taxonomically from other such divisions of a species" (Mayr *et al.*, 1953 : 30) one is forced to be illogical with these varieties. Thus the bleached populations of the pans and the dark populations of the mountains have no range that can be geographically defined and cannot therefore be recognized as subspecies. On the other hand, from the topography of the country, the pale desert birds of southern Africa have a range in the west and centre which can be defined and they can therefore be recognized as a subspecies, *A. n. bocage*, though logically their status in respect to the species as a whole is no different from the bleached or dark varieties. However these difficulties and seeming illogicalities are not confined to pipits and are relatively unimportant as long as they are understood.

A third difficulty in determining subspecies is the vexed question of how many to recognize in a cline. Clinal variation is found throughout most of the Palearctic and Asian species and in deciding which subspecies to recognize I have been influenced largely by the usefulness, or otherwise, of retaining a name. For instance if a population, intermediate in size, contains a high percentage of specimens which, on measurement, can be identified as belonging to it alone, it seems useful to give it a name, for then a proportion of wintering birds will also be identifiable and their movements can be plotted.

This point introduces the question of subspecific identification of wintering birds. The majority of regional handbooks which define the characters of subspecies do so in such a confident and assured manner that the student is led to believe that all individual birds can be named. This is certainly not true : it is especially misleading in studying the Palearctic species in which birds from breeding populations as far apart as Russia and Japan may be found together in winter on the north Indian plains alongside the resident forms. Some individuals can, through some diagnostic character of size or pattern, be identified subspecifically with certainty and ascribed to a particular breeding population : these specimens are of great value in plotting migration routes and local movements. However, in my opinion, any attempt to name others individually which have not wholly diagnostic characters results in the building up in collections of alleged subspecies which bear little relation to the breeding populations of the same name. More can be learnt by studying series of wintering birds from a given area and comparing their characters and ranges of measurement with series of breeding birds. In this way it can be deduced, for example, that the majority of Rock Pipits wintering on the east and southern coasts of Britain belong to the Scandinavian race, *A. spinoletta littoralis*, rather than to the British race, *A. s. petrosus*, although few individuals can be named. Similarly it can be shown that the Tawny Pipits, *A. campestris*, that winter in eastern India are drawn from a different breeding population from those wintering in Africa.

This paper is not, however, concerned with detailed definition of the characters and ranges of subspecies except in so far as they affect specific identification, or in cases where I have additions or corrections to make to accepted views. For the Palearctic species I have used Vaurie (1954 and 1959) as a basis, and for African

species the list prepared by White for the *Check-List of Birds of the World*, vol. 9. Both these authors have answered patiently all my questions and I have been fortunate in being able to work with White on the African pipits; any revisions to his list, as sent to press, have been discussed with him.

Subspecific variation has not been studied in the Australasian and American species.

GROUP A. PALAEARCTIC, ASIAN, AFRICAN AND AUSTRALASIAN
SPECIES WHICH PRESENT DIFFICULTY IN IDENTIFICATION

All the species in this group have a wide range and many are highly migratory: they have few distinctive characters common to all plumages and are therefore the most likely to present difficulties in identification. It seems important to understand these difficulties fully rather than to minimize them. For this reason I have tried to illustrate in the discussion and in the plates the amount of variation found in all characters, rather than to illustrate only a typical pattern, claw, wing or tail, which might indicate a distinctiveness not found in all individuals.

The characters are described under each species, or each geographical group within a species, but the measurements have been grouped in eight tables (Tables 2-9, pp. 275-278) for easy comparison. In the sections on identification of each species notes have been made on how it can best be distinguished from all others likely to occur in the same area.

In the widespread Richard's Pipit, *A. novaeseelandiae*, it is convenient to discuss variation and identification under four geographical groups, but no other species has been divided.

1. *Anthus novaeseelandiae*—Richard's Pipit

Specific characters.—Variable in size. Above, tawny to dark brown, clearly streaked on head and mantle: below, pale buff or white, the breast spotted with well-defined spots, but these are sparse and confined mostly to the upper breast except in Australasia. The hind claw medium or long, comparatively weak and often rather straight. The first three primaries longest and sub-equal with the fourth slightly shorter except, occasionally, in Australasia: the fifth primary about 7-10 mm. shorter than the fourth: the second, third and fourth emarginated and the fifth slightly emarginated in Australasia. The tail pattern white, the pattern on the inner web of the second outermost rectrix usually in the form of a narrow white streak up more than half the shaft, only slightly wider at the tip; this is sometimes reduced to a short streak against the shaft, near, or at, the tip; occasionally, in Africa only, reduced to a mere speck at the tip.

The juvenile has scalloped plumage, with rather darker and heavier spotting on the breast than the adult.

AUSTRALASIAN, MELANESIAN AND PHILIPPINE RACES OF RICHARD'S PIPIT

Characters and variation.—There is still some difference of opinion as to whether or not the African and Asiatic races should be considered conspecific with the Australasian races of Richard's Pipit. Australasian races are generally whiter and more

streaked below, and have blunter wings. These are very slight differences but might be sufficient to justify recognizing two species were it not that the Australasian races are linked to the Asiatic races through the small white-bellied *albidus* of Flores and Lombok, the slightly buffier *medius* of Timor and the Moluccas, and the lightly streaked *lugubris* of the Philippines. The slightly blunter wing of the Australasian birds seems likely to indicate that they are more sedentary, rather than to have specific significance. Many subspecies have been separated in the Australian area on slight differences of colour and pattern, and in the New Zealand area island races, *aucklandicus*, *steindachneri* and *chathamensis* are recognized from Auckland, Antipodes and Chatham Islands. The New Guinea *exiguus* is a dark montane form.

It has also been suggested that the resident races of southern Asia should be included with the Australasian races in *A. novaeseelandiae*, and the Palearctic and African races separated as *A. richardi*. The presence of populations in Annam and south China, *sinensis*, which are intermediate between the two groups, shows that this also would be an artificial and arbitrary division which does not seem justified.

Identification. With the exception of the very distinctive and un-pipit-like *A. gutturalis* of New Guinea, *A. novaeseelandiae* is the only pipit resident in the Australasian area. The Pechora Pipit, *A. gustavi*, winters in Indonesia but can be distinguished by its more pointed wing, richer colour above with heavier streaking extending on to the tail coverts, and some white streaks in the mantle. It also has broader white edges to the wing coverts, more streaks on the breast and flanks and the tail pattern dusky rather than white.

Occasional stragglers of other migrant species may be found as far south as New Guinea, but the only ones likely to be confused with the resident birds are those of other races of *A. novaeseelandiae*. In particular a straggler of the Philippine race, *lugubris*, or *malayensis* of south-east Asia, might be confused with *medius* of the Moluccas. It should be noted that *medius* has a shorter and more curved hind claw than either, is whiter below than *malayensis* and has heavier streaking on the breast than *lugubris*. However, *lugubris* and *malayensis* are not normally migratory and are less likely to be found outside their territory than the migrant races of north Asia. All of these are larger and have buffier underparts than any of the resident Australasian or Melanesian forms.

THE NON-MIGRATORY ASIATIC RACES OF RICHARD'S PIPIT

Characters and variation. The non-migratory pipits breeding in India, Burma, Siam and Indo-China southwards to Ceylon, Sumatra and possibly Borneo, are distinguished from the migratory Palearctic races by smaller size. There is considerable variability in colour among small breeding populations throughout the area: in particular Col. W. W. Phillips has drawn my attention to the relative darkness of birds from the highlands of Ceylon in comparison with those from the coastal districts. These dark birds can, however, be matched with some from highland districts in Malaya, and it is not therefore practical to subdivide this group on any but broad lines. Three intergrading races are all that I can define—*waiteti*, from north-west India is generally greyer and less heavily streaked both above and below: *malayensis* from south of lat. 14° S. in both India and south-east Asia is the most

rufous and heavily streaked : *rufulus* links the two, ranging north to Upper Burma, Yunnan and Tonkin in the east, and is intermediate in colour, intergrading with both *malayensis* and *waitei*.

There is also indication of a slightly larger breeding population in Annam which is worthy of note only because it may be a step in the cline between the smaller southern and the larger northern races.

In all this group there is haphazard partial moult throughout the non-breeding season.

Identification—subspecific. Table 3 shows how the resident southern races can usually be distinguished on size alone from the migrant races. In India and Burma the only overlap in size is between males of the resident races and females of the migrant races. In Indo-China and Thailand a small proportion of winter visitors of the Chinese race, *sinensis*, cannot be distinguished from the resident *rufulus* or from the Annam population.

Identification—specific. In the east there is no other pipit with which birds of this group are likely to be confused, but in north-west India *A. n. waitei* and the smaller race of the Tawny Pipit, *A. campestris kastschenkoi*, are very similar. They can be distinguished by some minor differences in the relative lengths of the tarsus and wing, and in the structure of the hind claw, bill and wing. These will be discussed more fully under *A. campestris*.

Similarly a small female of the migrant *A. godlewskii* could be confused with large males of both resident races of Richard's Pipit but has slight differences in size and tail pattern which will be discussed under that species.

Among other pipits which may occur in winter in northern India, only some autumn birds of *A. cervinus*, which have not acquired the red throat, are at all similar in colour, pattern and size to the resident Richard's Pipits: these Red-throated Pipits can be distinguished by the streaking on the breast being darker, more clearly defined and extending further down the breast. They are also darker, less tawny, brown with a streaked rump and slight differences in tail pattern and wing formula.

THE MIGRATORY PALAEARCTIC RACES OF RICHARD'S PIPIT

Characters and variation. The large races of Richard's Pipit breed across Asia from western Siberia and migrate chiefly to southern Asia, but stragglers have occurred in many countries from Britain and Lake Chad to Borneo and New Guinea. Breeding birds have been divided into several races on combinations of colour and size, but variation is still imperfectly understood owing to lack of adequate breeding series throughout Siberia and central Asia. A large, rather dark race, *A. n. richardi*, breeds in western Siberia; a smaller, paler race, *A. n. dauricus*, in Transbaikalia; a large race, *centralasiae*, from Tian Shan eastwards is said also to be pale, though this is not apparent in the few specimens studied; a small, dark, semi-migratory race, *sinensis*, breeds in South China, and a darker race, *ussuriensis*, in east Siberia and north China is intermediate in size between *sinensis* and *richardi* (*ussuriensis* is considered a synonym of *sinensis* by Vaurie but a fairly extensive series of breeding birds from south China indicates that there is little overlap in measurements between birds of the two populations)

In Table 3 measurements quoted by Vaurie and other workers that are outside the dimensional limits of specimens measured personally, are included in brackets, since my own are obtained from very short series of breeding birds.

It has already been noted in the discussion on moult that all the migrant races of Richard's Pipit are particularly subject to haphazard winter moult. This enhances the difficulties of using colour and pattern in the identification of wintering birds, since no two specimens are ever in truly comparable plumage. Since dimensions are only diagnostic in a very small proportion of birds of the four Siberian races I consider it is best to refer to all wintering birds of these races collectively as *A. n. richardi* subsp.

Identification. Distinction between the Palaearctic and resident races has been shown to be chiefly in size and is illustrated in Table 3.

Specifically *A. n. richardi* subsp. cannot be distinguished in the colour and pattern of the plumage from *A. godlewskii*, but are a richer colour and usually more heavily marked above and below than *A. campestris*. Detailed difference will be discussed under those two species.

The other large pipits of Asia are not likely to be confused with Richard's Pipit. *A. nilghiriensis* of the Nilgiri Hills is not unlike in colour but is short-winged with streaking on the lower breast and flanks. *A. sylvanus* of the Himalayas is also short-winged with very fine streaking below, and *A. similis* is a comparatively unpatterned species both above and below. All have blunter wings and other differences in tail pattern and in the conformation of the hind claw.

Migrants to Europe and Africa of *A. n. richardi* subsp. are also unlikely to be confused with any endemic African or European species but it seems very possible that a straggler to north-east Africa would be overlooked among the resident races of Richard's Pipit, *A. n. cinnamomeus*. Dimensions are the most reliable guide in distinguishing between them, *cinnamomeus* having a usually shorter tail and tarsus, but, in addition, the African birds are usually less heavily patterned above due to the feathers having darker edges contrasting less with the dark centres.

AFRICAN RACES OF RICHARD'S PIPIT

Characters and variation. Richard's Pipit is found through south, east and central Africa westwards to the Cameroons, though it is inexplicably absent from any of the countries of the Middle East except as an occasional migrant. Taxonomically the varying African populations form a most unsatisfactory group though, at the same time, their inconsistencies give rise to fascinating speculation on their relationships and origins. Too little is known of some of the most interesting forms to go far with this at present and it is outside the scope of this paper except in so far as it is necessary to recognize that in central and southern Africa there are three isolated atypical forms, *lwenarum*, *editus* and *hoeschi* which seem more closely linked to each other than to surrounding races. This suggests that there has been a double invasion of the territory and that the atypical birds represent an older population. The two isolated western races, *cameroonensis* and *lynesi*, have also some atypical characters and it is convenient to discuss all these atypical forms separately from the other races.

Typical races of *A. novaeseelandiae* are found in the eastern half of the country from Abyssinia southwards, and in the whole south and south-west. They have the same general colour and pattern as Asiatic forms but with the patterning not quite so distinct on the mantle. They are intermediate in size between the resident and migratory Asiatic races but with a shorter tarsus in relation to the wing: the hind claw never reaches the exaggerated lengths of some Asiatic birds and is commonly about 12 or 13 mm. long: the tail pattern on the second outermost rectrix is commonly the typical elongated streak up the shaft but in occasional specimens of central Africa it is reduced to a little more than a white tip. These specimens will be discussed with the atypical races. There are also examples, notably among darker, montane varieties, in which the pure white in the tail is replaced by dusky white.

The protracted breeding season of African pipits makes it difficult to study the sequence of moult, but it is apparent that in most populations there are two peak periods in the year, probably corresponding to the normal complete post-breeding moult and the partial pre-nuptial moult. However, the preponderance of specimens collected in other months in which there are feathers in sheath, or some recently moulted feathers, suggests that African as well as Asiatic birds are subject to haphazard off-season moult.

White (1957) has shown that it is impractical to recognize more than three races among the typical populations. These correspond to the three resident races of Asia. The tropical *cinnamomeus* is the most heavily streaked and corresponds to *malayensis*: the sub-tropical *bocagei* of the dry south-west is the palest, greyest, and least heavily streaked and corresponds to *waitei* of the Punjab: *rufuloides* of the wetter south-east, north about to the Zambezi, is intermediate and corresponds to *rufulus*. As in Asia there are recognizable micro-populations in different ecological conditions: very dark birds are associated with the mountains of the eastern Congo, Tanganyika and Nyasaland; rather more richly coloured birds with areas of red soil (though in many cases the rich appearance is largely due to soil-staining): within the paler race there are exceptionally bleached populations associated with limestone pans such as the Etosha and Makarikari Pans. Though names have been given to many of these varieties their discontinuous distribution precludes them being recognized as true subspecies.

The three southern atypical forms, *lwenarum*, *editus* and *hoeschi*, which I have suggested belong to an older population, have also a discontinuous distribution within the range of the typical forms. All three are large and rather dark, unique in having the pattern of the second outermost rectrix reduced to a tiny spot: the pattern on the outermost is dusky rather than pure white. The race *lwenarum* from north-western Rhodesia is also uncharacteristic of *A. novaeseelandiae* in having the dark centres of the mantle feathers and the spots on the breast ill-defined, giving a less streaky effect. The Basutoland *editus* has exceptionally dark centres to the mantle feathers. The South West African *hoeschi* is known only from two specimens, of which the type only has been examined. It is similar in size and in colour above to *lwenarum*, below the spotting on the breast is closer to *bocagei*: the tail pattern is reduced to a spot on one second outermost rectrix and a tiny faint streak on the other.

It has already been noted that the abnormal reduction in the tail pattern is found occasionally in specimens of *cinnamomeus* near the range of *lwenarum*, and so is the dusky white of the tail pattern.

The two atypical western races, *cameroonensis* and *lynesi*, are both dark with heavy streaking on the breast : *cameroonensis* of Mt. Cameroon is paler below and rather greyer above than *lynesi*, which has rich buff underparts. Apparently *lynesi* occupies other montane areas in the Cameroons, migrating as far as Darfur in May and June. These two races differ from others in having consistently shorter hind claws, never over 11 mm., and in having the tail pattern dusky (*cameroonensis*) or buff (*lynesi*), but of the typical elongated pattern.

Identification. In general colour and pattern the African forms of *A. novaeseelandiae* and *A. similis* are very alike, *similis* being only slightly less distinctly streaked. Chapin (1937) has pointed out that they can be distinguished by the fifth primary, which is emarginated in *similis* but not in *novaeseelandiae*. This is not, however, always easy to determine in worn or damaged specimens and a further check is provided by the relative lengths of the inner primaries, particularly the difference between the fourth and fifth which in *novaeseelandiae* is about 7-9 mm. so that the wing tip appears to be formed of the first four primaries ; in *similis* the difference is less than 4 mm. so that the first five form the wing tip. The majority of specimens of *A. novaeseelandiae* can also be distinguished by the elongated tail pattern and the long hind claw, but the wing is an additional and surer check where atypical forms of *novaeseelandiae* occur, especially in central Africa, for here *A. similis* has also an atypical form, *A. s. schoutedeni*, with a tail pattern similar to that of *A. novaeseelandiae*.

Very worn specimens of Richard's Pipit, which have lost the pattern on the mantle, might also be confused with the plain backed species, *A. leucophrys* and *A. vaalensis*, which have the same wing formula. In all but atypical *A. novaeseelandiae* the whiteness and extent of the tail pattern should be diagnostic, and in most cases the measurements as well, since *A. novaeseelandiae* is usually smaller with a shorter tail than sympatric Plain-backed Pipits.

The migrant, *A. trivialis*, has a shorter bill, more extensive streaking on the breast, a different wing formula and hind claw.

2. *Anthus godlewskii*—Blyth's Pipit

Specific characters. Large. Above, tawny brown, clearly streaked on head and mantle : below, pale buff, the breast spotted with well-defined spots, but these are sparse and confined mostly to the upper breast. The hind claw of medium length and comparatively weak. The first three primaries longest and sub-equal with the fourth slightly shorter : the fifth about 10 mm. shorter than the fourth : the second, third and fourth emarginated. The tail pattern white with the pattern on the second outermost rectrix a triangle, broad at the tip and tapering to a point close to the shaft not more than 30 mm from the tip and usually about 15 mm. : occasionally reduced further but always retaining a triangular shape rather than appearing as a streak along the shaft.

Blyth's Pipit has a haphazard winter moult and a partial spring moult, similar to Richard's Pipit, in the body feathers, innermost secondaries, wing coverts and central rectrices, but no specimens have been examined in which primaries or other rectrices have been in winter moult.

The juvenile has scalloped plumage and below the spotting is slightly denser and darker but less well-defined than in the adult.

Range. Breeds in central Asia from Transbaikal and eastern Manchuria to Tibet and Assam, migrating to India, Ceylon, Andaman Islands, Burma and Yunnan. It has once been found at Lake Chad (White, 1957 : 33).

Geographical variation. None recognized.

Identification. The identification of Blyth's Pipit was discussed fully (Hall, 1957) : it was found that individual specimens are quite indistinguishable in colour and pattern from *A. novaeseelandiae richardi* subsp., except for the tail pattern. The triangular shape, as distinct from the elongated shaft streak, is diagnostic in the majority of specimens but in the extreme variations when the triangle is most elongated or greatly reduced it is not so easy to recognize.

In series it is just apparent that the spots on the breast of Blyth's Pipit are rather more sharply defined and triangular.

A. godlewskii can, however, be best distinguished from all Asiatic races of Richard's Pipit by the relative length of wing and tarsus, though the difference is fine. In the length of the wing and tail *A. godlewskii* is similar to the migratory races, *A. novaeseelandiae richardi* subsp., but has a tarsus 24–28 mm. against 28–33 mm. It has a longer wing and tail than the resident races but a similar tarsus. There is a small overlap in overall dimensions with *A. n. sinensis* which can be resolved by taking the wing/tarsus ratio into account as this in *A. godlewskii* is 3.2–3.8, against 2.9–3.1 in *sinensis*.

Added to the differences in dimensions and tail patterns it will be found that the length of the hind claw in many migrant specimens of Richard's Pipit is wholly diagnostic, since in *A. godlewskii* it is rarely over 14 mm.* and in the rare extreme cases the weak tapering tip is curved sharply, while in *A. n. richardi* subsp. the claw is rarely under 15 mm. with a straighter tip. In series the legs of *A. godlewskii* in the dried skin appear paler than those of *A. novaeseelandiae*.

There are therefore several fine distinctions on which these two species can be distinguished but it is advisable to take all into consideration.

A. godlewskii is generally more heavily streaked above and below than *A. campestris*, but confusion might arise in comparing worn skins with young *campestris* which are more heavily streaked than the adults. Table 5 shows that *A. godlewskii* has usually a shorter bill than *A. c. campestris* and a longer wing than the eastern race *A. c. kastschenkoi*. In addition *A. campestris* has a similar elongated tail pattern to *A. novaeseelandiae*, and a slightly stouter, more curved hind claw.

3. *Anthus campestris*—Tawny Pipit

Specific characters. Large. Above, light or tawny brown, indistinctly streaked

* Hall (1957 : 730) recorded in error the maximum length as 17 mm. This should be 15 mm.

on the head and mantle in adults : below, pale buff, with little or no spotting on the breast in adults : the young bird quite distinctly streaked above and on the breast. The hind claw short to medium, curved and moderately strong. The first three primaries longest and sub-equal with the fourth slightly shorter : the fifth about 10 mm. shorter than the fourth : the second, third and fourth emarginated. The tail pattern white with the pattern on the second outermost rectrix usually in the form of a long narrow streak up the shaft, only slightly wider at the tip : this is sometimes reduced to a short streak near the tip.

The Tawny Pipit has a haphazard winter moult of some body feathers, wing coverts, innermost secondaries and central rectrices, and a partial spring moult into similar plumage.

The juvenile has scalloped plumage and distinct dark spotting on the upper breast.

Range. Breeds in the Palaearctic region westwards from the Yenisei to Britain (one record) and south to northern India, Palestine and the Atlas Mts. Winters also in southern India, Arabia and Africa north of the equator.

Geographical variation. There is considerable local variation in colour from sandy to greyish among the Tawny Pipits, with a higher proportion of greyer birds in the east, and some conspicuously pale birds breeding in parts of the Middle East, but these variations seem to be ecological and discontinuous rather than geographical and no races are here recognized on colour alone. There is, however, a significant decrease in size eastwards and I recognize *A. c. kastschenkoi* as a smaller race breeding between the Ob and Yenisei rivers, and wintering in India. Measurements of all Indian wintering birds show that both *A. c. campestris* and *A. c. kastschenkoi* winter in the west of the country, and many specimens are indeterminate, but that *kastschenkoi* alone winters in the east, in United Provinces and Bihar. In series *kastschenkoi* is rather greyer than *campestris*. The smaller, greyer Indian birds were formerly known as *A. c. griseus*, described from Tian Shan, but it has since been found (Hall, 1957) that Tian Shan birds are not smaller than European birds, so that *griseus* is considered a synonym of *campestris*.

Identification. The plainer back and plain breast of the majority of the specimens of the Tawny Pipit serve to distinguish it from all other pipits in the area except for some races of *A. similis* : these, however, can always be recognized by their blunter wings, dusky and reduced tail pattern and usually by longer tails.

First winter birds and some adults of *A. campestris* which have retained some spotting on the breast are not, however, easily distinguishable from some Richard's Pipits, which have a similar wing formula and tail pattern. In particular some specimens of the small *A. c. kastschenkoi* are easily confused with the paler, lightly streaked *A. n. waitei* in north-west India. The best guides to identification are the relatively short tarsus and long wing of *A. campestris* and its shorter and more curved hind claw and finer bill. In the dried skin the bill and legs of *A. campestris* are usually paler than those of *A. novaeseelandiae*.

The same principles of identification apply to juveniles as to adults but the fact that measurements are useless makes it difficult to identify all juveniles of *A. campestris*, *A. novaeseelandiae* and *A. godlewskii* with certainty.

4. *Anthus similis*—Long-billed or Indian Rock Pipit

Specific characters. Large with a long tail, except in central and west Africa. Above, variable in colour from light to dark brown, with the streaking on the head and mantle sometimes very indistinct, sometimes heavy, but never sharply defined except in first winter birds: below, light to rich buff, with the streaking on the breast variable, sometimes very indistinct and sparse, sometimes dark and extending to the lower breast, but never very sharply defined. The hind claw short, curved and strong. The first four primaries longest and sub-equal with the fifth never more than 8 mm. shorter than the fourth and usually under 5 mm. shorter, so that the first five primaries from the wing tip: the second to fifth primaries emarginated. The tail pattern dusky white or buff and the pattern on the inner web of the second outermost rectrix limited to a small triangle near the tip except in one atypical form in central Africa, *schoutedeni*.

A. similis has no apparent winter or spring moult, and the plumage does not seem to wear as quickly as that of other species that have been discussed.

The juvenile has scalloped plumage and has well-defined spotting, rather than streaking, on the breast.

Range. Breeds in suitable territory in most of Africa south of the Sahara, Sokotra, Arabia, and from Palestine to India with an isolated population in central Burma. Not truly migratory but subject to local movement, particularly in the sub-tropical forms which come down from the hills in winter.

Geographical variation. About twenty races are recognized varying for the most part in small degrees of colour, patterning and size. There are broadly two groups, one of the almost unstreaked races found in the sub-tropics and the other of the more heavily patterned tropical races.

The plain-backed Asiatic races include the large, sandy *jerdoni* of north-eastern India, the greyer *decapatus* of north-western India westwards to Iraq, and the small grey *captus* of Palestine. The large dark races, *travancoriensis* and *similis* of southern India, and the smaller *yamethini* of central Burma, are more heavily patterned: in *travancoriensis* the triangular pattern on the second outermost rectrix is consistently of the more extensive varieties (illustrated as 1 and 2 on Plate 60) which are found only rarely in other Asiatic forms. Both *arabicus* and the long billed *sokotrae* are small and heavily patterned. In Africa north of the equator *nivescens*, *jebelmarrae* and *asbenaicus* are less heavily patterned than the races of eastern and central Africa, *hararensis*, *hallae*, *nyassae*, *dewillei* and *schoutedeni*, and the dark *bannermani* and *josensis* of West Africa. South of the Zambezi the races *leucocraspedon* and *nicholsoni* are again less heavily patterned.

None of these races show any noteworthy characters except for *jebelmarrae* and *asbenaicus* of Darfur and the Sahara, and *schoutedeni* of the southern Congo and Angola. In *jebelmarrae* and *asbenaicus* the tail pattern is heavily reduced, so that it is absent or a mere tip, on the second outermost rectrix and confined to a small triangular pattern on the outermost: in *schoutedeni* the tail pattern on the second outermost rectrix is often elongated in a streak up the shaft and nearly as extensive as in *novaeseelandiae*. Furthermore *schoutedeni* shows other approaches to *novaese-*

elandiae in having the patterning above and below more clearly defined than is usual in *similis* and the breast spotted rather than streaked; the bill is also shorter than is common in *similis*. The range of *schoutedeni* is from the middle Congo river through the Kasai to Angola and north-western Rhodesia, but occasional specimens of the more eastern *nyassae* have either the short bill or the elongated tail-pattern of *schoutedeni*.

Identification.—In Asia the plainer races of *A. similis* bear a superficial resemblance to *A. campestris*, and the more heavily patterned races to migrants of *A. novaeseelandiae* and *A. godlewskii*. They can all be distinguished by the blunter wings and different tail pattern, and usually also by the length of the tail and hind claw.

In Africa as in Asia there is the same superficial resemblance between many of the races of *A. similis* and *A. novaeseelandiae* and through most of the country the same specific differences of wing formula and tail pattern are diagnostic, in addition to the more sharply patterned appearance of *A. novaeseelandiae*, the straighter hind claw and usually shorter tail. It cannot, however, be emphasized too strongly that in parts of central Africa, within or bordering the ranges of *A. novaeseelandiae lwenarum* and *A. similis schoutedeni*, all these distinctions are not diagnostic, for these two races both show an approach in some characters to the other species. Thus *lwenarum* has the dusky restricted tail pattern and ill-defined streaking above typical elsewhere of *A. similis*, and *schoutedeni* has the extensive tail pattern, more sharply defined pattern above and shorter bill typical elsewhere of *A. novaeseelandiae*. In this area therefore the surest guide to identification is the blunter wing and longer emarginated fifth primary of *A. similis*, with the shape of the hind claw as an additional check.

Even the least patterned races of *A. similis* in fresh plumage are distinguished by the amount of streaking on the mantle from the Plain-backed Pipits, *A. vaalensis*, *A. leucophrys* and *A. pallidiventris*, but very worn birds present greater difficulty. The wing formula is some help, but not a certain guide since the fifth primary of some of the Plain-backed Pipits has some emargination and is frequently only 5 mm. shorter than the fourth, though the difference is never less than that. The tail pattern may also be diagnostic since the typical *similis* triangle is found only rarely in Plain-backed Pipits in southern Africa, in some specimens of *A. vaalensis*, or, in northern Africa, as a very dusky and ill-defined pattern in some specimens of *A. leucophrys*. Dimensions may be a guide as well, particularly the usually longer bill and tail of *A. similis*, and many Plain-backed Pipits have a longer, straighter and weaker hind claw.

5. *Anthus vaalensis*, *A. leucophrys* and *A. pallidiventris*—the Plain-backed Pipits

The Superspecies.—The relationship of the three plain backed species of African pipit is so complex and still so little understood that it is convenient to consider them as a superspecies and discuss them together. From the data at present available it seems that in South Africa there are two sibling species, *A. vaalensis* and *A. leucophrys*, which show some different ecological preferences and which can be dis-

Map to Show Distribution of Plain-backed Pipits



Key

*A. pallidiventris*.

Southern Africa.

*A. leucophrys*
(*leucophrys*, *bohndorffi*).*A. vaalensis*
(*vaalensis*, *chobiensis*, *neumanni*).Northern Africa. (*A. leucophrys*).Dark races
(*omoensis*, *zenkeri*, *ansorgei*, *gouldii*)Light races
(*saphiroi*, *goodsoni*).1. Area where *zenkeri* and
goodsoni have been
found together.2. Intergrade between
zenkeri and *goodsoni*.3. Intergrades between
zenkeri and *saphiroi*.

tinguished in the hand by colour, size and the relative lengths of the hind claw : there is also some slight difference in tail pattern. Northwards, in Angola, Northern Rhodesia and Nyasaland, the differences are less well marked but just apparent. Northwards again there is a strip across Africa through the Belgian Congo and Tanganyika from which *A. vaalensis* and *A. leucophrys* are absent but in the west of which the long legged *A. pallidiventris* is found. From West Africa to Kenya, north of this strip, there is no reliable evidence of two species being present, light and dark populations of the *leucophrys/vaalensis* types being alopatic and linked by intergrades : there is no correlation between lightness of colour, size and the length of the hind claw, as in South Africa, and furthermore both types of tail pattern associated with the different species in South Africa are found haphazard in the north among individuals of varying colours. White (1948) hitherto has believed both *A. vaalensis* and *A. leucophrys* to be present in the north, basing his conclusion on the record of both light and dark birds being found together near Lake Naivasha in Kenya. However, since this is the only area of overlap and lies between the ranges of darker and paler populations it does not necessarily imply that the two forms breed alongside : it is quite possible that some of these were non-breeding birds from neighbouring areas, and if this is so only one species need be recognized in the north.

I suggest tentatively that, in the course of evolution, the Congo population was at some time isolated and developed as a good species, *A. pallidiventris* ; elsewhere two other species, *A. vaalensis* and *A. leucophrys*, developed through some ecological preferences, but, before speciation was complete, some change in climate or vegetation in the north broke down the ecological barrier and the two re-united there, forming a single semi-hybrid, species. Taxonomy cannot give a picture of these relationships and I therefore propose for convenience to treat *A. pallidiventris* as a distinct species and to recognize both *A. vaalensis* and *A. leucophrys* in southern Africa, but refer all northern forms to *A. leucophrys*.

Characters of the Superspecies.—Large. Above, tawny to dark brown, with slight obsolescent streaks on the head : below, light buff, with light, ill-defined streaking confined to the upper breast. Hind claw variable, from fairly long and strong (*pallidiventris*, and *leucophrys* in S. Africa) to short and weak (*vaalensis* in S. Africa) The first four primaries longest and sub-equal with the fifth 5–10 mm. shorter than the fourth : the second to fourth emarginated, and the fifth sometimes slightly so. The tail pattern dusky or buff with the pattern on the second outermost rectrix frequently reduced to a mere spot, occasionally a well-defined triangle near the tip (some specimens of *vaalensis* in South Africa), occasionally an elongated streak along the shaft (*leucophrys* in South Africa), all variations being found in northern Africa.

The Plain-backed Pipits do not appear to have any off-season or pre-nuptial moult.

The juveniles have scalloped plumage with distinct streaking on the breast.

Ranges (see Map.)—In southern Africa *A. leucophrys* ranges from Cape Province, Natal, Transvaal through northern Bechuanaland and northern South West Africa to Angola, Northern Rhodesia, southern Belgian Congo and Nyasaland. *A. vaalensis* ranges from Cape Province north through South West Africa, Bechuanaland and the Transvaal to Angola, southern Belgian Congo, Nyasaland and Portuguese East Africa. *A. pallidiventris* is found in Spanish Guinea, Gaboon, the Lower

Congo, and extreme northern Angola. In northern Africa *A. leucophrys* ranges from Portuguese Guinea to British Somaliland south to the northern Belgian Congo and Kenya.

Geographical variation.—In South Africa *A.v. vaalensis* is large, sandy-coloured with a short, weak hind claw, and sometimes with a small well-defined triangular spot on the second outermost rectrix: it is replaced northwards from Angola to Nyasaland by *A.v. neumanni* which is a smaller and less sandy race, variable in colour with lighter and darker populations interspersed (Hall, 1959): in *neumanni* the tail pattern is invariably a mere spot. Birds from Southern Rhodesia are intermediate. *A.l. leucophrys* in southern Africa is a smaller, darker bird than *A. v. vaalensis* with a longer, straighter and stronger hind claw: it has commonly an elongated streak up the shaft on the second outermost rectrix, and has also been found sometimes to have a bright yellow lower mandible, in contrast to the invariably duller bill of *A. vaalensis*. The variation in bill colour in *A. leucophrys* is not fully understood but is probably seasonal. In central Angola and Northern Rhodesia *A.l. leucophrys* is replaced by the darker *A.l. bohndorffi*, which, like *A.v. neumanni*, has little or no pattern on the second outermost rectrix. A single rather grey specimen of *A. leucophrys* has been examined from Duque de Bragança in northern Angola, and four very dark specimens were examined by White from Thysville, Lower Congo, none of which can at present be referred to any race.

A. pallidiventris differs from *A. leucophrys* in its stronger, and usually longer, leg, stronger foot with longer hind toe, and stronger hind claw. The tarsus measurements show a slight overlap at 30 mm. but the relatively greater strength of the leg of *pallidiventris* is always apparent. In addition there is some difference in the bill structure, the nostrils of *pallidiventris* being more exposed, giving the bill the appearance of being longer, although the measurements from the base of the skull may be the same as in *leucophrys*. *A.p. pallidiventris* in Gaboon and the Lower Congo is darker than *A.p. esobe* which is found further up the river near Coquilhatville: a single specimen examined from Luanda, northern Angola, matches closely with *esobe*.

The forms of northern Africa ascribed to *leucophrys* vary from the dark and small *gouldi* and *ansorgei* in West Africa, and the dark *omoensis* of northern Abyssinia, to the light brown *saphiroi* of southern Abyssinia and the even lighter *goodsoni* of Kenya. Most of the range from northern Nigeria to the borders of Kenya and south-west Abyssinia is occupied by *zenkeri* which is a comparatively dark bird, varying in different populations but browner than the other dark races. Intermediates between *zenkeri* and *saphiroi* are found in south-west Abyssinia (Uba, Konso and Mega), and one intermediate between *zenkeri* and *goodsoni* has been examined from Eldoret in north-west Kenya: both *goodsoni* and *zenkeri* have been found between Nakuru and the Mara River, as has already been noted.

In the paler races, *goodsoni* and *saphiroi*, there is some consistency in the hind claw, which is never very long, and in the tail pattern which is never elongated: in these respects these races show the characters of *vaalensis*. In the darker races however, every variation of tail pattern is found, sometimes well-defined and sometimes so dark as to be almost indistinguishable, and the hind claw varies from 9–18

mm. It is this degree of variation in two characters which are so often specifically diagnostic that makes me suggest that this is a hybrid population.

Identification.—Distinctions between the Plain-backed Pipits and worn specimens of *A. similis* have been discussed under that species. Worn specimens of *A. novaeseelandiae* are unlikely to lose all trace of patterning but can also usually be recognized by the white and clearly defined tail pattern.

Distinctions between the three species of Plain-backed Pipit have been discussed under geographical variation but can be summarized briefly as follows :—

South Africa.—*A.v. vaalensis* larger, paler and with shorter hind claw than *A.l. leucophrys*, with occasional differences in tail pattern.

Southern central Africa.—*A. vaalensis neumanni* less easily distinguished from *A.l. leucophrys* and *A.l. bohndorffi* owing to similarity in size, and variability in colour, but paler in all variations than the latter, and with the hind claw weaker and usually shorter. The lower mandible of *A. leucophrys* sometimes bright yellow.

West central Africa.—*A. pallidiventris* with a stronger and usually longer leg than *A. leucophrys* and a more exposed bill.

6. *Anthus pratensis*—Meadow Pipit

Specific characters.—Medium sized. Above, olive brown, with clear streaking on head and mantle : below, white or light buff, with spotting on the breast dark and well-defined, changing on the lower breast and flanks to sparse streaks. The hind claw fairly long and weak. The first three primaries longest and equal, the fourth usually less than 1 mm. shorter, occasionally 2 mm.: the second, third and fourth emarginated. The tail pattern white with a small triangle, spot or streak near the tip of the second outermost rectrix, never very extensive : the primaries and rectrices sometimes rather pointed.

The Meadow Pipit has a partial moult into similar plumage between January and March. This is usually limited to the body, central rectrices, innermost secondaries and some wing coverts.

The juvenile is not scalloped and resembles the adult except that the streaking is more extensive on the underparts and heavier above and below : the mantle is a richer, redder brown, less olive than the adult, but the edges of the wings are olive brown as in the adult.

Range.—Breeds from south-east Greenland to western Siberia, south to southern France, northern Italy and the Balkans : winters in Europe, north Africa, the Middle East and Turkestan.

Geographical Variation.—There is a cline in colour from the richest birds in the west to the greyest in the east of the range. The name *theresae* was given to the richest coloured birds, based on some collected in Ireland in autumn, and believed by Williamson (1959) to belong to the breeding population of Iceland. It is possible to identify as *theresae* a few exceptionally richly coloured specimens among winter birds from other parts of Britain and western Europe and also to recognize in series that the rest of the wintering birds of Britain are richer coloured than those of Europe and North Africa. It may be assumed therefore that they are drawn from a breeding

population intermediate between *theresae* and *pratensis*, probably from Scotland and the Hebrides. Ringing has shown that birds breeding in England move south to winter.

Identification.—The combination of small size, short bill and olive brown edges to the wings distinguish the Meadow Pipit from all the species that have been discussed previously. It is most likely to be confused with the Tree Pipit, *A. trivialis*, but has a finer bill and a longer and less curved hind claw: the markings on the breast of *A. pratensis* are also usually rather less heavy and, in Europe, the difference between the third and fourth primaries of *A. trivialis* is usually greater than 2 mm.

The Pechora Pipit, *A. gustavi*, and some female and young Red-throated Pipits, *A. cervinus*, are similar in size and not unlike in colour to the Meadow Pipit, but have lighter edges to the feathers of the mantle and head, streaked upper tail coverts, whiter edges to the wing coverts, and plain brown, not olive brown, edges to the wings. *A. gustavi* has, in addition, a distinctive tail pattern and wing formula.

7. *Anthus trivialis*—Tree Pipit

Specific characters.—Medium sized. Above, light brown to olive brown, with clear streaking on head and mantle: below, white or light buff, with spotting on the upper breast dark and well-defined, changing on the lower breast to sparse, narrow streaks. The hind claw short and curved. The first three primaries longest and equal, the fourth commonly about 5 mm. shorter than the third in western birds, and 1–2 mm. shorter in Indian birds: the second and third emarginated, the fourth slightly emarginated in western birds and more clearly in Indian birds. The tail pattern slightly off white with the pattern on the second outermost rectrix a small spot, triangle or streak near the tip of the inner web, never very extensive: the rectrices usually rather pointed.

The Tree Pipit has a partial moult of body feathers, taking place in January and coming into similar plumage.

The juvenile is not scalloped and resembles the adult except that the streaking is heavier below and the general colour above is slightly redder brown.

Range.—Breeds in most of Europe and western Asia to Lake Baikal, between latitudes 40° N. and 70° N.: winters throughout Africa, south to the Transvaal, in the Mediterranean region, Persia and most of India.

Geographical variation.—Siberian breeding birds tend to be greyer than European, especially on the upper tail coverts, and have been separated as *sibirica*: they also have frequently more white in the tail, the more elongated pattern being common: the fourth primary is usually 2–3 mm. shorter than the third, against 4–5 mm. in western birds of typical *trivialis*. None of these characters is constant and I do not believe it is practical to attempt to differentiate between wintering birds of *trivialis* and *sibirica* though the names may be retained for the breeding populations.

There is also some clinal variation in size, the largest birds breeding in Russia, where the wings of males may reach 95 mm. and Scandinavia (♂ 87–90): breeding birds from Britain and France are smaller (♂ 84–87) and so is *sibirica* (♂ 81–88). No wintering birds with wings over 90 mm. have been examined from West Africa or

India and it can therefore be assumed that the Russian population winters exclusively in eastern Africa.

In Turkestan and the north-western Himalayas there is a very distinct race, *haringtoni*, in which the markings on the head, mantle and breast are darker and heavier, the bill is stouter and the difference between the third and fourth primaries is less than 3 mm. No breeding birds examined show intergradation between *haringtoni* and *trivialis* or *sibirica* but some wintering birds of northern India show one or other of the characters, and may be presumed to belong to some intermediate population. In winter *haringtoni* moves down to the plains of northern India but does not undertake the vast migrations of *trivialis* and *sibirica*.

Identification.—The Tree Pipit is most likely, in Europe, to be confused with the Meadow Pipit, *A. pratensis*, but has a stouter bill and a distinctive short, curved, hind claw. The markings on the breast are usually more extensive and, in Europe, the fourth primary is usually shorter.

Among other characters the stout bill and unstreaked upper tail coverts distinguish the Tree Pipit from the young Red-throated Pipit, *A. cervinus*, and the Pechora Pipit, *A. gustavi*. The lack of green tone in the plumage or green edges to the wings distinguish it from the Indian Tree Pipit, *A. hodgsoni*.

In central and southern Africa the wintering Tree Pipit is best distinguished by its short bill, legs and hind claw from the resident races of *A. novaeseelandiae*, and by its short legs, clear streaking and pointed wing from those of *A. similis*.

8. *Anthus hodgsoni*—Indian Tree Pipit

Specific characters.—Medium sized. Above, olive green with green edges to wing and tail and with blackish streaking on head and mantle varying from very light to heavy: below, white, with dark, broad, well-defined streaking variable in extent. The hind claw short and curved, The first three primaries longest and sub-equal, the fourth 1–4 mm. shorter: the second, third and fourth primaries emarginated. The tail pattern slightly off-white with the pattern on the second outermost rectrix in the form of a small spot or triangle near the tip, sometimes extending about 25 mm. up the shaft.

The Indian Tree Pipit has a partial moult of body plumage and some wing coverts from February to April.

The juvenile is like the adult but more heavily streaked on the mantle and underparts, the streaks wider as well as more extensive: the greens of the plumage are more bronzy, especially on the edges of the wings and wing coverts.

Range.—Breeds from the Pechora in north-eastern Russia, eastwards to the Kurile Islands and Japan, southwards to the Himalayas and Szechwan. Winters in India, Burma, Siam, Indo-China, Japan and the Philippine Islands.

Geographical variation.—The most northern breeding birds are the least heavily streaked, both above and below, the streaks in the mantle in fresh plumage being narrow, faint and ill-defined and the streaks below heavily concentrated on the upper breast, extending only sparsely on to the lower breast and flanks. Ripley (1948) has shown that these birds should be called *yunnanensis*. Southern birds, *A. h.*

hodgsoni, breeding from the Himalayas to central China, are more heavily streaked, the streaks on the mantle being black and well-defined, narrow on the mantle and rather broader on the head: the concentrated streaking on the breast extends to the lower breast and there is more streaking on the abdomen. In *yunnanensis* the fourth primary is usually 1–3 mm. shorter than the third, in *hodgsoni* the difference is usually less than 1 mm. These two races therefore show similar differences in pattern and wing formula to those that distinguish the northern and southern populations of *A. trivialis*.

There is, in addition, a population breeding in Japan which is difficult to place taxonomically since it hardly shows sufficiently distinct characters to warrant a name, and yet is not truly typical of either race. It is slightly less heavily streaked than *hodgsoni*, though closer in this character to *hodgsoni* than to *yunnanensis*: it has on average a longer bill and shorter tail than either of the other races (Table 8): the wing is usually similar to *yunnanensis* and more pointed than *hodgsoni*. These characters are trivial and do not readily identify individual specimens, but they serve to show that most of the wintering birds of Formosa and the Philippines, as well as some of those from Japan and Indo-China, belong to the Japanese breeding population. These birds have sometimes been described as intermediates between *hodgsoni* and *yunnanensis* but are not truly intermediate in either the morphological or geographical sense, and it seems preferable to refer to them as an atypical population of *hodgsoni*. Specimens listed as this population in Table 8 include four summer birds from Japan and winter birds from Japan, Formosa and the Philippines which which are distinct from *yunnanensis* on size and/or colour.

Ripley (op. cit.) believed also that there was a distinct population, *A. h. berezowskii*, of very heavily streaked, long billed birds breeding in south-east Tibet and Sikkang province, China. This view was based on twelve specimens: two of these he has told me (in litt.) he has since found to be immature *A. roseatus*: through his kindness it has been possible to re-assemble most of the remainder of the series: these have been compared with the exceptionally good series in the British Museum and it was found that all showing very wide streaks were young birds of either *hodgsoni* or *roseatus*, and those with a long bill either *roseatus* or Japanese *hodgsoni*. There are therefore no apparent grounds for recognizing *A. h. berezowskii* as distinct from *A. h. hodgsoni*.

Identification.—The green edges to the wings and the green in the upperparts distinguish *hodgsoni* from all other species except *A. roseatus*. In autumn plumage *A. roseatus* is superficially very similar to the adult *hodgsoni* and even more so to the young bird. The two species can best be distinguished by the hind claw, which is short and curved in *hodgsoni* and longer and weaker in *roseatus*: in addition *roseatus* has a distinctive tuft of lemon yellow in the axillaries, is usually a larger bird with a longer bill, darker legs, and less clear white underparts.

9. *Anthus roseatus**—Hodgson's Pipit

Specific characters.—Medium to large sized. Above, upperparts in autumn olive

* This species may in future have to be known as *A. pelopus* Gray (see Deignan 1960, Bull. Br. Orn. Cl. 80: 120.)

brown, with dark, wide streaks on head and mantle, edges of wings green : in spring and summer the upperparts are grey and heavily streaked : below, in autumn, white with a faint wash of pink or buff, the breast heavily streaked with the streaking extending to the lower breast and flanks : in spring and summer there is little or no streaking and the chin to the lower breast is a vinous pink : axillaries lemon yellow. The hind claw medium, weak and comparatively straight. The first four primaries longest and sub-equal : the second, third and fourth emarginated. The tail pattern slightly off white, the pattern on the second outermost rectrix confined to a medium or small triangle near the tip.

Hodgson's Pipit has a complete moult of body plumage between December and March into the distinctive breeding dress.

The juvenile plumage is generally similar to that of the adult in autumn but is browner above and less heavily streaked below, with no streaking on the abdomen.

Range.—Breeds in the mountains of central Asia from Afghanistan to China and Tonkin, descending to the plains in winter.

Geographical variation.—None apparent.

Identification.—The green edges to the wing distinguish *A. roseatus* from all other Asiatic species except *A. hodgsoni*. As has already been noted, autumn birds and young birds of the two species can be confused but are distinguishable on the shape of the hind claw, colour of the legs, the lemon yellow axillaries of *A. roseatus*, and sometimes also on size. The spring plumage of *A. roseatus* is quite distinctive since no other pipits have pink on the underparts except the Water Pipit, *A. spinoletta*, in which the pink is less vinous in tone, and the Red-throated Pipit, *A. cervinus*, in which the pink is confined to the throat and upper breast. Furthermore neither of these species have any green in the wings or yellow axillaries.

10. *Anthus cervinus*—Red-throated Pipit

Specific characters.—Medium sized. Above, tawny brown in autumn, grey brown in spring, distinctly streaked on head, mantle, rump and tail coverts, with some indistinct white streaks on the mantle : wing coverts broadly edged with white : below, pale creamy buff, in autumn clearly streaked with black on the breast, lower breast and flanks, the throat either white or with some orange pink, the pink found more commonly and more extensively in males : in spring males have the throat and breast orange pink with little or no streaking except on the flanks and sides of the lower breast : females usually have the pink confined to the throat with sparse streaking on the upper breast as well as the lower breast and flanks. The hind claw medium or long, weak and comparatively straight. The first three primaries longest, the fourth between .5 and 2 mm. shorter than the third : the second and third primaries emarginated, the fourth usually only slightly so. Tail pattern slightly off white, the pattern on the second outermost rectrix confined to a small triangle at the tip, rarely extending more than 10 mm. up the shaft.

The Red-throated Pipit has a complete moult of body plumage between January and April into the distinctive breeding dress.

The juvenile plumage is similar to that of the adult female in autumn without

pink on the throat, but more rufous brown above with the streaks below longer and less clearly defined.

Range.—Breeds in northern Europe and Asia from Scandinavia, north of lat. 67° N., to north-eastern Siberia, and occasionally to Alaska. Winters in Africa south to southern Nigeria, the Belgian Congo and Tanganyika, occasionally in Arabia, the Maldive and Andaman Islands, Burma, Siam, Indo-China, Celebes, Borneo and the Philippines, but not in the greater part of peninsular India.

Geographical variation.—Some slight differences have been noted between the eastern and western breeding populations. The eastern birds are slightly greyer above, slightly less streaked below and average smaller (see Table 8). In addition the wing tip is usually blunter, the fourth primary being nearly equal to the third and more noticeably emarginated than in western birds, in which the difference between the third and fourth is usually about 2 mm. These differences do not seem great enough to justify the recognition of two races, but the name *rufogularis* is available for western birds if required.

Identification.—Pink-throated birds are quite distinctive, the pink being richer, more orange, and less extensive on the breast than in pink-breasted specimens of *A. roseatus* and *A. spinoletta*. Young birds and some autumn females of *A. cervinus* are easily confused with *A. pratensis* and *A. trivialis* but can be distinguished by the streaked upper tail coverts, brown, rather than olive-brown, edges to the wings and feathers of the mantle, the broader white edges to the wing coverts, and heavier streaking below: *A. cervinus* has also a longer hind claw than *A. trivialis*. The Pechora Pipit, *A. gustavi*, is similar to *A. cervinus* in colour and pattern above but is smaller with a more pointed wing and a more extensive pattern on the tail; below the streaking is narrower and mostly confined to the upper breast; the bill is heavier.

II. *Anthus gustavi*—Pechora Pipit

Specific characters.—Small. Above, brown, heavily streaked on head, mantle, rump and tail coverts, with two or three white-edged feathers to the mantle forming an indistinct V on the back: below, white or pale creamy buff, with dark, clearly defined streaks, heavy on the upper breast, rather sparse on the lower breast and flanks. The hind claw of medium length and weak. The first three primaries longest, the fourth about 4 mm. shorter than the third: the second and third primaries emarginated. The tail pattern buff or dusky white, the pattern on the second outermost rectrix usually a tapering streak extending about halfway up the shaft, but occasionally restricted to a small elongated triangle at the tip: the rectrices pointed.

The Pechora Pipit has a complete body moult between January and April into similar plumage.

The juvenile is similar to the adult except that the streaking below is less clearly defined but more extensive on the throat and abdomen.

Range.—Breeds in Eastern Europe and Siberia north of about lat. 64° N., from the Pechora region to the Bering Strait. Winters in Borneo, Timor, Celebes and Moluccas, migrating through Korea, eastern China and the Philippine Islands:

occasional stragglers travel westwards, and have been recorded at Fair Isle at different times.

Geographical variation.—Three races are recognized : the nominate race over most of the range, a slightly larger and possibly paler race, *A. g. commandorensis*, in the Commander Islands, and a darker, smaller race, *A. g. menzbieri*, breeding in south Ussuriland. The winter ranges of the respective races have not been defined but there are in the British Museum specimens which, on measurement, appear to be *commandorensis* from Celebes (♀, undated, wing 85), Labuan (unsexed, undated, wing 88) and Shawsishan (♂, May, wing 86) : also some May birds which on colour and size appear to be *menzbieri* from south China and the Philippines (wings 1 ♂ 80, 1 ♀ 74, 3 unsexed 73–79 mm.). As shown in Table 8 the few specimens available in the British Museum indicate a wider range of measurements than quoted by Johansen (1952 : 152) for the different races : his figures are quoted in brackets.

Identification.—In autumn the Pechora Pipit is easily confused with the female Red-throated Pipit. The white streaks on the mantle of *A. gustavi* have been quoted as a diagnostic character, but some white streaks are also found in *A. cervinus*, though they are not usually so pronounced or in the indistinct V pattern. Other differences between the two species have already been noted in the discussion on *A. cervinus*, and include wing formula, tail pattern and size. In winter quarters *A. gustavi* may be found in the same area as the Molucca race of Richard's Pipit, *A. novaeseelandiae medius* : this is also a small pipit but has heavy streaking above and below, with the streaks above not extending to the tail coverts, and it has a less pointed wing.

12. *Anthus spinoletta*—Rock and Water Pipits

A. spinoletta is divided into two ecological groups of coastal and inland races. It is convenient in discussing the species to use the common name "Rock Pipit" for the coastal races of western Europe, *petrosus*, *kleinschmidti* and *littoralis*, and to use "Water Pipit" for all other races.

Specific characters.—Medium sized. Above, varying from light chocolate or deep olive brown in autumn to grey brown or grey in spring ; the streaking on head and mantle ill-defined with no sharp contrast between the feather centres and the paler edges : below, dusky white or buffish, usually suffused with pink in spring in variable degree : in autumn extensively streaked often on the abdomen as well as the breast, but the streaking ill-defined and often light in colour : in spring the streaking sparse or absent except in some Rock Pipits which have no distinctive spring plumage. The hind claw of medium length, weak and usually rather curved : the legs dark except in young birds and some from eastern Asia. The first four primaries longest and sub-equal : the second, third and fourth emarginated. The tail pattern clear white in Water Pipits, dusky in Rock Pipits : in Water Pipits from Europe and western Asia the pattern on the second outermost rectrix is usually confined to a small triangle near the tip, but is more extensive in those from eastern Europe and America : in Rock Pipits it is a mere speck at the tip or so dusky as to be indistinguishable.

Most of the races of both Rock and Water Pipits have a body moult between January and April into distinctive breeding dress, but Mayaud (1952) has shown that this moult is absent or incomplete in Rock Pipits of Britain, coastal France and the Atlantic islands.

The juvenile is similar to the adult in autumn except for the paler legs. It is a plainer, more chocolate brown above than other young pipits.

Range.—Widespread in the Northern Hemisphere. The Rock Pipits breed on the coasts of western Britain, northern France, the Faroe islands and Scandinavia, the northern birds migrating south in autumn, sometimes as far as Portugal and Italy but more usually to Britain and France. The Water Pipits breed inland in the mountains of Europe and Asia Minor, Turkestan, northwards and eastwards to Mongolia and the Bering Sea, across North America north of lat. 48° N. to western Greenland, also in the Rocky Mts. south to California. All populations move south in autumn reaching the Mediterranean, Egypt, Arabia, northern India, northern Burma, Tonkin and the Gulf of Mexico. Stragglers have occurred at even more widespread localities.

A single juvenile specimen in the British Museum (No. 98.10.20.749), previously identified as another species, was collected in the valley of the Yenisei at lat. 61° 30' N. on 8th August 1877. This represents an extension of the range of the species as shown by Dementiev and Ghladkov (1954: Map 121). The similarity in colour of this specimen to young birds from North America suggests that it is probably *A. s. japonicus*, which is closely allied to the American races, rather than the paler *A. s. blakistoni*.

Geographical variation.—The Rock Pipits are more olive-brown than the Water Pipits, this being particularly noticeable on the rump: below the streaking is more extensive and the underparts are more washed with yellow-buff: the tail pattern is dusky rather than pure white. Within this group there is a cline from the largest, darkest and most heavily streaked race, *kleinschmidti*, in the Faroes and Hebrides, to the less richly coloured race, *petrosus*, of Wales, Ireland, England and France, and the shorter billed, paler race, *littoralis*, of Scandinavia. The most striking variation in these populations is caused, however, by the degree of moult in the body plumage that takes place from January onwards. In *kleinschmidti* and *petrosus* there is little or no winter moult so that spring birds are still dark and heavily streaked: in *littoralis* there is a fairly extensive winter moult varying individually but giving all birds a distinctive breeding dress with usually some pink on the breast, less streaking and a greyer back. Mayaud has noted that a fairly complete moult is sometimes found also in birds of the population of *petrosus* breeding on Ushant, giving them a *littoralis*-like appearance in spring. It is probable that there is some mixing of *littoralis* with this population since large numbers of Scandinavian birds winter on the coasts of northern France and a few, possibly birds coming early into breeding condition, may settle with the residents. There is also from Ushant an apparently aberrant male bird in the Meinertzhagen collection (cited as the co-type of *A. s. ponens*) collected 23rd September 1933, which is in fresh plumage similar to *littoralis* in spring. In autumn plumage most individual specimens cannot be named with certainty, but from series it is apparent that the majority of Rock Pipits

wintering on the eastern and southern coasts of Britain are migrants from Scandinavia, since there are few amongst them with bills of 19 mm. which are common in *petrosus* but not found in *littoralis*. An occasional very dark, large specimen can be identified with some confidence as *kleinschmidti*.

A number of names have been given to intermediate populations which do not seem sufficiently distinct to warrant recognition on available material.

Opinions differ on the races to be recognized among the Asiatic populations of the Water Pipits, and I am more in agreement with the ranges and races recognized by Dementiev and Ghladkov (1954 : map 121) than with Vaurie. *A. s. spinoletta* of Europe is a fairly lightly streaked race with a pale pink flush in spring : the breeding birds of central Asia and China, *A. s. blakistoni*, are paler in all plumages : wintering birds of Egypt, to which the name *coutelli* was given, average smaller and have the streaking above more pronounced than either *spinoletta* or *blakistoni* ; the marks on the breast in autumn are less streaky more spotty than *spinoletta* and slightly heavier than *blakistoni*, and the rest of the underparts are washed with pale orange buff ; in spring the pink wash is warmer and more orange in tone than in either of the other two races. *A. s. coutelli* is believed to breed in the Caucasus and Persia. It seems useful therefore to retain the two names, *coutelli* and *blakistoni*, to indicate the extremes of what is probably a cline across Asia. Winter birds are hard to identify but throughout Persia, Afghanistan and north-western India the few that can be named either on size or colour are mostly *blakistoni*. However in Sind and United Provinces birds that are too small for *blakistoni* are common : those in spring plumage are near in colour to *coutelli*. Some of these are exceptionally small, even for *coutelli*, and it is possible that they belong to an unlocated breeding population in the Himalayas east of the range of typical *coutelli*. The lowest dimensions of these exceptional birds are included in brackets with *coutelli* in Table 9.

The most eastern Asiatic race, *A. s. japonicus*, is more distinctive than the other two. It breeds in eastern Siberia, possibly intergrading with American races in the extreme north-east, and migrates chiefly to China and Japan with some stragglers coming westwards to India and Burma. It is a dark race, with black, well-defined spots on the breast which are extensive in autumn but also present, though sparse, in spring : the wash on the underparts in spring is orange buff rather than pink : the legs are paler than in other races and the white in the tail often more extensive.

Three American races are now recognized, the paler *pacificus* from the west, the darker *rubescens* from the east, and a mountain population in Colorado, *alticola*, said to have a richer spring plumage. All these are fairly close to *japonicus* but differ in autumn in being a warmer brown above with less pronounced streaking, and having the spots on the breast less clearly defined and browner : in spring they are plainer in series, greyer and darker above ; below the streaking is much reduced or absent : the white in the tail is usually extensive, as in *japonicus*, but the legs are dark as in all other races. Vaurie believed that *harmsi*, based on migrants taken in Turkestan, should be considered a synonym of *rubescens*, since a co-type matched American birds. He has kindly sent me the specimen of Zarudny's on which this opinion was based. While I do not consider one can be dogmatic on single specimens, to me this bird matches rather better with a series of *japonicus* than with American

birds. I would recommend that *harmsi* is transferred to the synonymy of *japonicus*, as this move has the added advantage of eliminating any question of whether or not *harmsi* should be used instead of *pacificus*, which it antedates, for the western American birds, now that *rubescens* is confined to the eastern populations.

Identification.—The differences between the two ecological groups of Rock and Water Pipits have been discussed under geographical variation. The species as a whole is unlikely to be confused with other pipits though in size and plumage variations it appears to be closely related to the greenish *A. roseatus*. The dark, comparatively unstreaked back, and dark legs combined with the extensive but ill-defined streaking or pale pink underparts of most races are quite distinctive. *A. s. japonicus* is more like *A. trivialis* and *A. pratensis* below than the other Palaearctic races, but has different dimensions and is greyer and less streaked above.

MEASUREMENTS OF SPECIES IN GROUP A

(based on a minimum of 15 ♂ 15 ♀ unless otherwise stated)

TABLE 2.—*Australian, Melanesian and Philippine Forms of A. novaeseelandiae* (pp. 253-254)

	Wing		Bill		Tail*		Hind claw	Tarsus ♂♀
	♂	♀	♂	♀	♂	♀		
All New Zealand races, 7 ♂, 6 ♀	89-99	84-90	16-18	16-17.5	67-72	63-68	11-13	23-26
<i>steindachneri</i> , 1 ♂, 2 ♀	87	86-87	20	18-19	61	57	12-13	24-26
<i>aucklandicus</i> , 3 ♂, 1 ♀	86-89	91	18-23	19	59-65	68	12-17	24-26
All Australian races, 12 ♂, 9 ♀	86-95	79-85	16-18	16-17	56-67	53-60	9-13	23-28
<i>exiguus</i> , 3 ♂, 4 ♀	85-87	77-83	17-18	16.5-18	57-60	52-56	10-12	25-27
<i>medius</i> , 5 ♂, 4 ♀	79-80	77-80	17-17.5	17-18	51-55	55-56	10-12	24-26
<i>albidus</i> , 2 ♂, 1 ♀	80	77	17	18	56-57	54	11	25-26
<i>lugubris</i>	78-83	75-79	17-18	16.5-18	52-58	51-55	12-19	27-29

* See p. 249.

TABLE 3.—*Asiatic Mainland, and Palaearctic Races of A. novaeseelandiae* (pp. 254-256)

	Wing		Bill		Tail*		Hind claw	Tarsus ♂♀
	♂	♀	♂	♀	♂	♀		
<i>richardi</i> (breeding), 7 ♂, 2 ♀	91-99 (101)	93-94	18.5-19	18-19	64-72	71	15-20	29-33
<i>centralasiae</i> (breeding), 4 ♂, 1 ♀	98-100 (96-102)	92	18-21	18.5	69-73	66	15-22	30-33
<i>dauricus</i> (breeding), 3 ♂, 2 ♀	90-96	87-92	18-19	17.5-18.5	63-69	64-69	14-19	28-31
<i>ussuriensis</i> (breeding), 5 ♂	90-95	—	18-19	—	63-70	—	15-18	30-31
<i>richardi</i> subsp. (all year)	90-102	87-94	18-21	17-19	63-73	62-71	14-22	28-33
<i>sinensis</i> (breeding), 8 ♂, 8 ♀	87-91	81-88	17-18	16.5-18	58-64	55-62	12-19	27-30
<i>Annam pop.</i> (breeding), 6 ♂, 5 ♀	80-90	80-86	16.5-17	16-17.5	57-62	54-59	10-18	26-29
<i>malayensis, rufulus, and waitei</i>	77-87	74-83	16-18	15-18	51-61	49-56	10-18	24-28

* See p. 249.

TABLE 4.—*African Races of A. novaeseelandiae* (pp. 256-258)

	Wing		Bill		Tail*		Hind claw	Tarsus ♂♀
	♂	♀	♂	♀	♂	♀		
<i>cinnamomeus</i> . . .	82-97	79-91	16-18.5	16-18	55-65	53-65	11-17	24-29
<i>bocagei</i> . . .	84-93	77-86	17-18.5	16-17	55-66	52-60	9-15	24-28
<i>rufuloides</i> . . .	87-94	84-93	16-18	16-17	59-64	57-61	11-15	24-28
<i>lwenarum</i> , 4 ♂, 1 ♀ . . .	93-95	97	17-19	19	65	67	11-13	28
<i>editus</i> , 3 ♂, 2 ♀ . . .	94-97	88-99	17.5-18	17	63-65	62-64	13-15	26-29
<i>hoeschi</i> , 1 ♀ (type) . . .	—	96	—	17	—	—	14	29
<i>cameroonensis</i> , 4 ♂, 2 ♀ . . .	91-95	93-95	17-19	18	57-68	64-65	9-11	26-28
<i>lynesi</i> , 4 ♂, 3 ♀ . . .	95-99	90-92	17-18	17-18	65-71	63-66	9-10	25-27

* See p. 249.

TABLE 5.—*Anthus godlewskii* and *A. campestris* (pp. 258-260)

	Wing		Bill		Tail*		Hind claw	Tarsus ♂♀
	♂	♀	♂	♀	♂	♀		
<i>A. godlewskii</i> . . .	90-97	84-93	16.5-18	16-17.5	62-70	59-64	11-15	24-28
<i>A. c. campestris</i> . . .	88-101	82-91	18.5-20	17-20	61-67	59-66	9-14	24-28
<i>A. c. kastschenkoi</i> . . .	85-90	80-87	17-18	16-17	55-65	54-61	8-13	23-26

* See p. 249.

TABLE 6.—*Races and Populations of Anthus similis* (pp. 261-262)

	Wing		Bill		Tail*		Hind claw	Tarsus ♂♀
	♂	♀	♂	♀	♂	♀		
<i>similis, travancoriensis</i> , 7 ♂, 2 ♀ . . .	90-96	89-90	19-21	19	72-76	70-72	9-11	26-28
<i>yamethini</i> , 8 ♂, 4 ♀ . . .	87-92	84-89	18-19	18	67-73	66-67	8-11	24-26
<i>decapitus, jerdoni</i> . . .	94-105	92-99	19-21	18-21	71-82	69-82	9-14	26-29
<i>capitus, arabicus</i> . . .	90-98	86-92	18-20	17-20	68-72	62-70	8-13	23-26
<i>nivescens, jebelmarrae, asbenai-</i> <i>sae, hararensis, hallae, nyas-</i> <i>sae</i> . . .	88-103	87-100	17-20	17-20	57-75	58-71	8-11	24-28
<i>schooutedeni</i> , 10 ♂, 3 ♀ . . .	86-97	85-92	15-17	15-17	57-65	58-60	8-10	23-25
<i>nicholsoni</i> and <i>leucocraspedon</i> <i>bannermani</i> and <i>josensis</i> , 3 ♂ . . .	91-102	87-96	17-21	17-20	64-72	58-72	9-14	24-28
<i>sokotrae</i> , 15 specimens . . .	85-86	—	17-18	—	60-64	—	7-10	24-25
	82-91		19-22		56-71		10-11	24-26

* See p. 249.

TABLE 7. *Anthus vaalensis*, *A. leucophrys* and *A. palidiventris* (pp. 262-266)

	Wing		Bill		Tail*		Hind claw	Tarsus ♂♀
	♂	♀	♂	♀	♂	♀		
Southern Africa								
<i>A. v. vaalensis</i> and <i>daviesi</i> , 15 ♂, 10 ♀	101-111	92-103	18-20	17-19	67-76	68-75	8-12	28-32
<i>A. v. neumanni</i> and <i>cho- biensis</i>	92-105	89-102	17-20	16-20	62-73	59-69	8-13	26-30
<i>A. l. leucophrys</i>	89-102	89-99	17-18.5	16-18	58-66	55-66	11-17	27-31
<i>A. l. bohndorffi</i>	95-102	89-97	17-19	16-18.5	60-71	58-64	12-17	27-31
Northern Africa								
<i>A. l. saphiroi</i> , 12 ♂, 10 ♀	90-101	90-97	17-18	15-17.5	61-67	60-67	10-12	24-28
<i>A. l. goodsoni</i> , 3 ♂, 7 ♀	99-102	93-99	17	16.5-18	65-70	63-66	10-12	27-29
<i>A. l. omoensis</i> , 13 ♂, 8 ♀	98-108	97-102	17-19	17-18.5	65-71	67-70	10-18	26-30
<i>A. l. zenkeri</i>	89-101	85-97	16-18.5	16-18.5	59-69	58-68	9-18	24-29
<i>A. l. ansorgei</i> , 9 ♂, 9 ♀	90-95	85-95	17-19	17-18	65-69	59-66	9-12	23-28
<i>A. l. gouldi</i> , 11 ♂, 4 ♀	86-96	88-89	17-19	17-18.5	58-69	60-65	9-14	25-27
<i>A. p. pallidiventris</i> , 4 ♂, 3 ♀	95-99	93-96	19-20	19-20	61-64	55-59	13-16	31-33
<i>A. p. esobe</i> , 2 ♂, 1 ♀	96-97	91	19-20	19	59	56	13-16	31-32

* See p. 249.

TABLE 8.—*Anthus pratensis*, *A. trivialis*, *A. hodgsoni*, *A. roseatus*,
A. cervinus, *A. gustavi* (pp. 266-272)

	Wing		Bill		Tail*		Hind claw	Tarsus ♂♀
	♂	♀	♂	♀	♂	♀		
<i>A. pratensis</i>	77-85	73-83	14-16	14-15	51-58	49-56	9-15	20-23
<i>A. t. trivialis</i>	84-95	80-90	14-16	14-16	50-61	51-59	8-10	20-23
<i>A. t. sibirica</i> , 15 ♂, 8 ♀	81-88	79-85	13-15	14-15	52-57	52-57	8-10	20-21
<i>A. t. haringtoni</i> , 12 ♂, 6 ♀	84-89	83-87	14-15	14-15	54-60	54-58	7-9	20-22
<i>A. h. hodgsoni</i> (typical)	79-86	77-85	13-16	14-16	53-61	50-59	8-9	20-22
<i>A. h. hodgsoni</i> (Japan, see p. ooo) 10 ♂, 7 ♀ 18 unsexed	81-86 (81-87)	81-83 (81-87)	15-16.5 (15-16.5)	15-16 (15-16.5)	51-55 (47-54)	50-53 (47-54)	8-9	20-22
<i>A. h. yunnanensis</i>	81-90	77-83	14-16	14-15	51-61	52-56	8-9	20-21
<i>A. roseatus</i>	86-92	79-87	15-17	15-16	57-62	52-58	10-14	22-24
<i>A. cervinus</i> , Europe and W. Siberia	83-90	80-87	14-16	14-15	49-56	47-55	9-13	20-22
<i>A. cervinus</i> , E. Siberia, 5 ♂, 5 ♀	83-85	79-83	14-15	14-15	51-55	48-51	9-13	21-22
<i>A. g. gustavi</i> , breeding 8 ♂ 6 ♀	81-86 (82-84)	77-82 (78-81)	16.5-17	15-16.5	47-51	47-51	10-13	20-22
<i>A. g. commandorensis</i> , breed- ing, 3 ♂, 1 ♀	86-89 (83-86)	85 (79-83)	16-17	16	51-55	55	10-13	24-26
<i>A. g. menzbieri</i> (winter), 1 ♂, 1 ♀, 3 unsexed	80 (76-79)	74 (73-77)	16 (15)	16 (15)	51 (45-46)	46 (45-46)	10-12	21-23

* See p. 249.

TABLE 9.—*Races and Populations of Anthus spinoletta* (pp. 272-275)

	Wing		Bill		Tail*		Hind claw	Tarsus ♂♀
	♂	♀	♂	♀	♂	♀		
<i>Rock Pipits</i>								
<i>kleinschmidti</i> (Faroes and Outer Hebrides)	88-95	83-89	18-19	19	58-62	58-59	11-12	23-25
<i>petrosus</i> (England, Wales, Ireland)	88-94	83-90	17-19	18-20	55-64	52-60	8-14	22-25
<i>littoralis</i> (Scandinavia)	87-93	80-87	16·5-18	16·5-18	56-60	51-56	9-14	23-25
<i>Water Pipits</i>								
<i>spinoletta</i>	88-95	80-89	16-18	15-17	57-63	54-60	10-14	22-24
<i>coutelli</i> (Egypt and Cyprus, 5 ♂, 9 ♀, and N. India, see p. 274)	85-92 (83)	80-87	16-17	16-17 (15)	55-61 (54)	54-59 (52)	10-13	23-25
<i>blakistoni</i>	88-96	83-90	16-18	16-18	59-66	56-61	9-14	23-24
<i>japonicus</i>	86-91	79-88	15-17	15-17	54-62	53-60	10-14	22-25
<i>pacificus</i> and <i>rubescens</i>	80-90	78-86	14-17	14-16	55-64	53-57	9-13	22-24

* See p. 249.

GROUP B. DISTINCTIVE ASIAN, AFRICAN
AND AUSTRALASIAN SPECIES

None of the species in this group presents difficulty in identification to any student with an appropriate regional handbook, since all have distinctive characters, many have very restricted ranges, and none is a true migrant. They have therefore not been illustrated: their characters have been summarized with particular reference to their distinctive characteristics: the range and any geographical variation is outlined: as a guide to general size measurements have been given of specimens available although in some of the rarer species the series is not adequate to show the full range of size.

ASIAN SPECIES

Anthus nilghiriensis—Nilgiri Pipit

Confined to high altitudes in the Nilgiri and Palni Hills of southern India, rarely descending to the plains.

A medium sized pipit with short, blunt wings and a short bill. Above, rich tawny brown, heavily streaked on head and mantle: below, rich buff, distinctly but sparsely spotted on the upper breast with small spots and lightly streaked on the lower breast and flanks. The hind claw of medium length and curved. The first four primaries sub-equal with the fifth only 1-2 mm. shorter: the second to fifth emarginated. The rectrices rather pointed, with the pattern buff: the pattern on the second outermost a tapering triangle up the shaft, and the third outermost having a small triangle at the tip. Measurements of 16 ♂ 11 ♀: wing ♂ 76-80, ♀ 73-78: bill ♂ 15-16, ♀ 14-16: tail ♂ 53-61, ♀ 52-60: hind claw ♂ ♀ 9-13: tarsus ♂ ♀ 24-25.

The well-defined streaking, short, blunt wing and extensive patterning on the tail combine to distinguish the Nilgiri Pipit from all others likely to be found in the area.

Anthus sylvanus—Upland Pipit

Confined to the mountains of central Asia from Afghanistan to Yunnan and eastern Sikang, rarely descending to the plains.

A large pipit with short, blunt wings and a short heavy bill. Above, light pinkish brown, heavily streaked on head, mantle, rump and tail coverts with dark brown : below, pale buff or white, streaked with fine hair-streaks on the lower breast, flanks and abdomen : these streaks are wider on the flanks and those on the breast divide at the tip of the feather forming a small triangle. The hind claw short and strongly curved. The first four primaries sub-equal with the fifth only 1–3 mm. shorter : the second to fifth emarginated. The rectrices narrow and very pointed with the tail pattern dusky and the same triangular pattern as in *A. nilghiriensis* on the second and third outermost. Measurements 22 ♂ 10 ♀ : wing ♂ 78–84, ♀ 74–80 : bill ♂ ♀ 16–18 : tail ♂ 59–69, ♀ 56–63 : hind claw ♂ ♀ 8–11 : tarsus ♂ ♀ 24–25.

There is a cline from paler birds, *A. s. oreinus*, in the west, to darker birds, *A. s. sylvanus*, in the east.

The fine hair-streaks on the abdomen, heavy bill and pointed rectrices distinguish the Upland Pipit from all others, but it can be seen that in the shape of the wing, the pattern of the tail and conformation of the hind claw, it has many points of similarity with the Nilgiri Pipit, which replaces it in the mountains of southern India.

AFRICAN SPECIES

Anthus berthelotii—Berthelot's Pipit

Confined to the Canary Islands and Madeira.

A small pipit with a long bill. Above, dark brown, the streaking on the head and mantle therefore not very distinct : below, white, with distinct spotting on the upper breast and sparse streaks on the sides of the lower breast and flanks. The hind claw fairly long and straight. The first four primaries sub-equal with the fifth about 6 mm. shorter : the second to fourth emarginated. The tail pattern white with the pattern on the second outermost rectrix, as in *A. campestris*, usually extending up the shaft in a tapering streak, sometimes reduced to a short streak near the tip. Measurements of 35 ♂ 22 ♀ : wing ♂ ♀ 69–79, bill, Canary Is. ♂ 15–17, ♀ 14–16, Madeira ♂ 16–18, ♀ 16–17 : tail ♂ ♀ 48–56 : hind claw ♂ ♀ 8–16 : tarsus ♂ ♀ 23–24.

Birds of Madeira have rather longer bills than those of the Canary Islands and have been separated as *A. b. madeirensis*. It has been suggested that there is some variation in colour between the populations of other islands but sufficiently good series of fresh plumaged birds are not available on which to establish this.

Size alone distinguishes Berthelot's Pipit from any of the Palaearctic migrants that might visit the islands. On field characters and voice it has been shown by Lack and Southern (1949 : 619) and Volsøe (1951 : 106) that this species has affinities with the Tawny Pipit, *A. campestris*. Morphologically there is little to suggest closer affinities with *A. campestris* than with some other species, the associations being dependent on which characters are selected as being of most importance : the similarity of hind claw, tail pattern and wing formula between *A. berthelotii* and *A. campestris* are offset by the considerable differences in pattern, colour, size, and in the lack of a spring moult.

***Anthus lineiventris*—Striped Pipit**

Found throughout most of Africa south of the Equator.

A large pipit with green edges to the wings. Above, dark brown, with heavy but indistinct streaking on head, mantle, rump and tail coverts; the wings and tail edged with green: below, creamy white, extensively streaked from the upper breast to the tail coverts with well-defined dark brown streaks. The hind claw short, curved and strong. The wing blunt, the first four primaries sub-equal and the fifth only 1-3 mm. shorter: the second to fifth emarginated. The tail pattern clear white and in the form of triangles of diminishing size on the inner webs of the three outermost rectrices. Measurements of 25 ♂ 22 ♀: wing ♂ 85-90, ♀ 82-88: bill ♂ ♀ 18-20: tail ♂ ♀ 59-68, ♀ 58-64: hind claw ♂ ♀ 9-10: tarsus ♂ ♀ 28-30.

The green edges to the wings and tail, combined with the extensive streaking below, make the Striped Pipit quite distinctive among African pipits, though with a superficial resemblance to the Palaearctic *A. roseatus* in autumn.

***Anthus brachyurus*—Short-tailed Pipit**

Sporadically distributed from Kenya to Angola and Natal.

A miniature, dark pipit. Above dark brown, with heavy but indistinct streaking on head and mantle. Below creamy-white on the breast, with heavy, well-defined, short streaks; white on the abdomen and flanks with very sparse fine streaks. The hind claw short and curved. The wing blunt, the first four primaries sub-equal and the fifth 1-3 mm. shorter: the second to fourth emarginated. The tail pattern dusky white on the outer rectrix and absent from or very small, on the second outermost. Measurements of 12 ♂ 12 ♀: wing ♂ 64-68, ♀ 60-65: bill ♂ 13-14, ♀ 12-13: tail ♂ 33-39, ♀ 32-36: hind claw ♂ ♀ 7: tarsus ♂ ♀ 16-18.

Northern birds, *A. b. leggei*, are alleged to be smaller and darker than the southern, *A. b. brachyurus*. The differences are just apparent but not very convincing and it seems impossible to make a clear division between the ranges of the two races.

The Short-tailed Pipit is the smallest Old World Pipit: the only other small pipits found in Africa are the following species, *A. caffer* and *A. sokokensis*, which are a richer brown with longer tails.

***Anthus caffer*—Little Tawny Pipit**

Sporadically distributed from southern Abyssinia to Angola and the Transvaal.

A small pipit with a misleading name since it is richer and less sandy in colour than the Tawny Pipit. Above, light brown, heavily and distinctly streaked on head and mantle: below, white, with dark brown streaks on the breast. The hind claw short and curved. The wing blunt, the first four primaries sub-equal, the fifth 2-4 mm. shorter; the second to fourth emarginated and the fifth slightly so. The tail pattern usually clear white, with a small spot or triangle on the second outermost rectrix: the pattern in Abyssinian birds is buffish and sometimes extends as a short streak up the shaft. Measurements of 8 ♂ 8 ♀: wing ♂ 67-77, ♀ 67-75: bill ♂ ♀ 12-16: tail ♂ ♀ 41-51: hind claw ♂ ♀ 6-8: tarsus ♂ ♀ 17-19.

Four races are recognized on slight differences of size and colour, *A. c. caffer* of

southern Africa and *A. c. mzimbaensis* of Nyasaland being slightly larger and longer billed than *A. c. australoabyssinicus* of Abyssinia and the paler *A. c. blayneyi* of Tanganyika.

The Little Tawny Pipit is richer coloured and longer tailed than the Short-tailed Pipit, with the richer brown above particularly noticeable on the rump in contrast to the dark, almost blackish rump of *A. brachyurus*.

It is similar in many respects to the next species, *A. sokokensis* which, in parts of East Africa, occurs in the same area, though not in the same type of country, but which is less rich in colour above, has a different pattern on the breast and lacks the pointed rectrices of *A. sokokensis*. Their relationship will be discussed later.

Anthus sokokensis—Sokoke Pipit

Confined to woodland clearings associated with surviving patches of forest in the Sokoke forest near Mombasa, Moa at sea level one hundred miles south, and the Pugu Hills near Dar-es-Salaam.

A small, richly coloured pipit with pointed rectrices. Above, rich orange brown, with broad, dark streaks on head and mantle and light streaks on the rump and upper tail coverts: below, creamy white, with large blotchy black spots confined to the upper breast. Hind claw short and rather straight. The wing blunt, the first four primaries sub-equal and the fifth only about 1 mm. shorter: the second to fourth emarginated, the fifth slightly so. The rectrices pointed with the pattern clear white, with a small, elongated triangle on the second outermost rectrix. Measurements of 1 ♂ 2 ♀: wing ♂ ♀ 68–69: bill ♂ 16, ♀ 15: tail ♂ 49, ♀ 46: hind claw ♂ ♀ 7–8: tarsus ♂ ♀ 18–19.

The similarity between the Sokoke Pipit and the Little Tawny Pipit can be appreciated by comparison of the descriptions and measurements. The chief differences lie in the richer colour above of the Sokoke Pipit, the different pattern on the breast and the shape of the tail feathers: they are similar in size and the general extent of the pattern above and below, and in the wing formula and tail pattern. It seems likely that *A. sokokensis* and *A. caffer* are derived from the same stock but have diverged in different environments.

Anthus melindae—Malindi Pipit

Confined to coastal Kenya.

A medium sized, plain backed pipit. Above, plain brown: below, white, with extensive light brown streaks on the breast extending sparsely to the abdomen and flanks. The hind claw of medium length and fairly straight. The wing blunt, the first four primaries sub-equal with the fifth about 3 mm. shorter: the second to fifth emarginated. The tail pattern dusky white on the outermost rectrix and absent from the second outermost in the few specimens examined. Measurements of 4 ♂ 1 ♀: wing ♂ ♀ 83–86: bill ♂ ♀ 16–17: tail ♂ ♀ 48–56: hind claw ♂ ♀ 10–11: tarsus ♂ ♀ 25–27.

The combination of the plain back and the extensive brown streaking below distinguish the Malindi Pipit from all others. It is also smaller than the Plain-

backed Pipits of the *A. leucophrys/vaalensis* group and larger than *A. brachyurus*, the only other African pipit with a plain back.

***Anthus chloris*—Yellow-breasted Pipit**

Confined to the south-eastern districts of South Africa.

A medium sized pipit with some bright yellow on the underparts. Above, light brown, heavily streaked on the head and scalloped rather than streaked on the mantle with very dark brown : below, in breeding dress, lemon yellow from the throat to the upper abdomen, with little or no streaking on the breast ; in non-breeding dress the yellow replaced by tawny buff except for a yellow patch on the upper abdomen. Hind claw long and weak. The wing blunt, the first four primaries sub-equal, the fifth less than 2 mm. shorter : the second to fifth emarginated. The tail pattern clear white with a small, elongated triangle on the second outermost rectrix and a spot on the third. Measurements of 8 ♂ 5 ♀ : wing ♂ 85–91, ♀ 82–85 : bill ♂ 17–18 : tail ♂ 60–65, ♀ 56–59 : hind claw ♂ ♀ 12–17 : tarsus ♂ ♀ 24–27.

In colour and pattern the Yellow-breasted Pipit is distinct from all other members of the genus *Anthus*. It has the appearance of a miniature Longclaw but lacks the rictal bristles that are considered a generic character of *Macronyx*. Birds in non-breeding dress bear a superficial resemblance to the female Golden Pipit, *Tmetothylacus tenellus*, but the Golden Pipit is easily distinguished by its yellow tail pattern and less richly coloured mantle. The two species are not normally found together since the Golden Pipit is primarily an East African species but there is one unsubstantiated record of its occurrence in the Transvaal.

***Anthus crenatus*—Cape Rock Pipit**

Confined to hills and mountains from southern and eastern Cape Province to Pondoland and eastern Transvaal.

A large almost plain, pipit with greenish edges to the wing, and rich buff underparts. Above, brown with faint streaks on head and mantle, a yellow-green shoulder and greenish edges to the wing : below, the throat white, the rest of the underparts light tawny brown with very faint streaking on the breast : axillaries yellow. The hind claw short and strongly curved. The wing blunt, the first five primaries sub-equal ; the second to fifth emarginated. The tail pattern buff, very reduced on the outermost rectrix and limited to a small spot at the tip of the second. Measurements of 5 ♂ 3 ♀ : wing ♂ 88–91, ♀ 83–86 : bill ♂ ♀ 19–21 : tail ♂ 56–61, ♀ 56–58 : hind claw ♂ ♀ 10–12 : tarsus ♂ ♀ 28–29.

The Cape Rock Pipit has a rather stocky build, heavy legs and bill giving an un-pipit-like appearance, though it has some features in common with *A. similis*. It is easily distinguished from the sympatric *A. similis nicholsoni* by the greenish edges to the wing, yellow shoulder and axillaries, and the plainer pattern above and below.

AUSTRALASIAN SPECIES

***Anthus gutturalis*—New Guinea Pipit**

Confined to the mountains of New Guinea.

A large, dark pipit. Above, dark brown, with indistinct streaks on head and

mantle : below, the throat yellow buff contrasting with pale sepia brown on the breast which merges into yellow buff on the abdomen ; the breast unspotted except in young birds. The hind claw short and strongly curved. The wing blunt with the second, third and fourth primaries sub-equal and the first and fifth about 2-3 mm. shorter : the second to fifth emarginated. The tail pattern very dusky and limited on the second outermost rectrix to a small triangle at the tip. Measurements of 6 ♂ 5 ♀ : wing ♂ 99-102, ♀ 93-98 : bill ♂ ♀ 17-18 : tail ♂ 64-77, ♀ 64-73 : hind claw ♂ ♀ 8-10 ; tarsus ♂ ♀ 27-30.

Three races are recognized on slight differences of colour and size.

The New Guinea Pipit in its heavy structure is another un-pipit-like member of the genus, but closest to the Cape Rock Pipit, *A. crenatus*, and *A. similis*. Its structure and the brown, unstreaked underparts distinguish it from the other resident pipit of New Guinea, *A. novaeseelandiae exiguus*, and from any likely migrants.

GROUP C. AMERICAN AND SOUTH ATLANTIC SPECIES

American species are poorly represented in the British Museum and it has not therefore been possible to make a detailed study of them. However it seems useful to list their characters under the same formula as has been used for the Old World pipits so that comparisons can be made easily between them. On the whole I do not find it possible to associate many American species directly with those of the Old World, especially without knowledge of their field characters, but I have noted a few instances in which there seems some relationship. As with species of Group B, members of this group have not been illustrated and the measurements, taken mostly from inadequate samples, are provided only to give indication of the relative sizes. It has not been possible to assess the degree of individual and geographical variation or the ranges of the races. Hellmayr (1935) and Zimmer (1953) have been followed.

Anthus spragueii

The only endemic North American pipit : breeding in the central plains from eastern Montana to Manitoba, migrating as far south as Mexico.

A medium sized, rather light-coloured pipit. Above, tawny brown, with broad but not very dark streaks on head and mantle : below, white on the abdomen, pale buff on the breast and throat, lightly and sparsely streaked on the upper breast with well-defined short streaks. The hind claw medium to long, rather weak and sometimes rather straight. The first four primaries sub-equal with the fifth about 8 mm. shorter : the second to fourth emarginated. The rectrices slightly pointed, with the pattern pure white extending in a long narrow streak up the shaft on the second outermost rectrix. Measurements of 10 ♂ 5 ♀ : wing ♂ 81-85, ♀ 79-82 : bill ♂ ♀ 14-15 : tail ♂ 51-57, ♀ 50-53 : hind claw ♂ ♀ 10-14 : tarsus ♂ ♀ 22-24.

Morphologically I can see no reason to consider *A. spragueii* specifically distinct from the following species, *A. furcatus*, of South America. The only differences between them are in the degree of marking on the breast and a slight difference in the size of the leg and foot as indicated by the length of the tarsus. Unless significant differences can be demonstrated in their field characters, I would recommend that Sprague's Pipit be considered a race of *A. furcatus*. In structure the two forms ap-

pear to be the New World representatives of the *A. campestris*/[*godlewskii*]/[*berthelotii*] complex, but I cannot speak for their field characters.

Anthus furcatus

Confined to central South America from Peru and Bolivia south to Uruguay.

Similar in all characters to *A. spragueii* except that the buff of the upper breast and throat is slightly darker and the streaks on the breast are broader, forming brown, rather heavy, spots, instead of the narrow, short streaks. Measurements of 8 ♂ 19 ♀: wing ♂ 77–85, ♀ 74–80: bill ♂ ♀ 13–15: tail ♂ 48–55, ♀ 48–52: hind claw ♂ ♀ 8–13: tarsus ♂ ♀ 20–22.

Birds from Peru and Bolivia have been separated as *A. f. brevirostris* and can be distinguished by slight differences in colour and size.

Anthus lutescens—(*A. chii* of Zimmer)

Widespread in South America from Panama to northern Chile, Argentine and Paraguay.

A miniature pipit. Above, dark brown, heavily streaked on head, mantle, rump and tail coverts: below, pale lemon yellow, with brown indistinct spotting confined to the upper breast. Hind claw long and rather straight. The first four primaries sub-equal with the fifth 4–6 mm. shorter: the second to fourth emarginated. The tail pattern clear white, with the pattern extending in a long narrow streak up the shaft on the second outermost rectrix. Measurements of 18 ♂ 19 ♀: wing ♂ 60–70, ♀ 59–69: bill ♂ ♀ 13–15: tail ♂ ♀ 39–46: hind claw ♂ ♀ 9–15: tarsus ♂ ♀ 19–21.

Zimmer recognizes four races on slight differences of colour, *A. l. parvus* from Panama, *A. l. abariensis* from the north of South America, *A. l. peruvianus*, from Peru and northern Chile, and *A. l. lutescens* from central South America.

It is tempting to associate *A. lutescens* with the miniature pipits of Africa, in particular with the dark *A. brachyurus*, but, in fact, the two species have little in common except their small size and dark appearance.

Anthus chacoensis

Confined to Argentine and Paraguay.

Similar to *A. lutescens*, except that the streaking above and below is more clearly defined and extends to the sides of the lower breast and flanks: the underparts are whiter: the hind claw is short (7–8 mm.): the pattern on the second outermost rectrix is restricted to a small spot at the tip. Measurements of 1 ♀: wing 65: bill 13: tail 44: hind claw 8: tarsus 20.

Anthus correndera

Found throughout central and southern South America from Peru and southern Brazil to Tierra del Fuego, and in the Falkland Islands.

A medium sized, heavily streaked pipit. Above, light brown, heavily streaked on head, mantle, rump and tail coverts with dark brown, and with a few white streaks in the mantle, similar to those in *A. cervinus*: below, white, heavily marked on the whole breast and flanks with large spots or broad dark brown streaks. The

hind claw long, straight and weak. The first four primaries longest and sub-equal with the fifth about 2-5 mm. shorter : the second to fourth emarginated. The tail pattern is clear white, with the pattern on the second outermost rectrix varying from a long narrow streak up the shaft to a small streak at the tip. Measurements of 37 ♂ 17 ♀ from South America : wing ♂ 72-80, ♀ 71-78 : bill ♂ ♀ 14-17 : tail ♂ 48-57, ♀ 47-52 : hind claw ♂ ♀ 10-20 : tarsus ♂ ♀ 21-24. Measurements of 8 ♂ from the Falkland Islands, *A. c. grayi* : wing 80-84 : bill 15-16 : tail 54-57 : hind claw 14-20 : tarsus 22-23.

Apart from the larger *A. c. grayi* of the Falkland Is. Zimmer recognizes four races : *A. c. chilensis* of Chile and Tierra del Fuego ; *A. c. correndera* from southern Argentine, Uruguay and southern Brazil ; *A. c. calamarcae* from northern Argentine : and *A. c. calcaratus* from Peru. The differences are not very well marked.

The superficial resemblance in colour and pattern between some specimens of *A. correndera* and the Palaearctic *A. gustavi* is remarkable, but nevertheless I do not think the two species are closely related as there is a significant difference in the juvenile plumage as well as some differences in the hind claw, wing formula and tail pattern. In *A. gustavi* the juvenile plumage is similar in most respects to that of the adult, whereas in *A. correndera* the juvenile has white edges to the mantle feathers, giving a scalloped effect and a less brown, more black-and-white, appearance than the adult.

The length of the hind claw and the tail pattern suggest that *A. correndera* may be the American representative of *A. novaeseelandiae* though it has more streaking both above and below.

Anthus antarcticus

Confined to South Georgia.

A large pipit, with extensive streaking below. Above, brown, heavily streaked on head, mantle, rump and tail coverts with dark brown, and some whitish streaks. Below, white washed with pale buff, heavily streaked on breast and flanks, with some light streaking on throat and abdomen, heavier in young birds. The hind claw long, and very heavy and straight. The wing blunt, the first four primaries sub-equal with the fifth only 2-3 mm. shorter : the second to fourth emarginated and the fifth slightly so. The tail pattern dusky white with little or no pattern on the inner web of the second outermost rectrix. Measurements of 3 adults : wing 81-84 : bill 16-19 : tail 58-62 : hind claw 13-17 : tarsus 25-26.

A. antarcticus appears to be the representative in South Georgia of *A. correndera*, but has diverged sufficiently to be regarded as a distinct species.

Anthus nattereri

Confined to south-eastern Brazil and Paraguay.

A medium sized, richly coloured pipit. Above, rich tawny brown, heavily streaked on head and mantle, and lightly streaked on the rump and tail coverts, with dark brown : below, throat white, washed with yellow, breast and flanks washed with rich orange buff and lightly streaked with brown, abdomen white. Hind claw long, weak and straight. Wing blunt, the first four primaries sub-equal, the fifth 4 mm. shorter : the second to fifth emarginated. Rectrices narrow and pointed, with the

tail pattern dusky with a long narrow streak up the shaft on the second outermost rectrix and a small spot on the tip of the third. Measurements of type only (unsexed) : wing 76 : bill 14 : tail 57 : hind claw 16 : tarsus 25.

Anthus hellmayri

Confined to central and southern South America from Peru to the Argentine and south-eastern Brazil.

A medium sized pipit, heavily streaked above, but lightly streaked below. Above, light or rich brown heavily streaked on head, mantle and rump with dark brown : below, pinkish buff, with narrow sparse streaks on the upper breast and flanks. Hind claw medium to long, rather strong and usually rather curved. The wing blunt, the first four primaries sub-equal, the fifth 1-2 mm. shorter : the second to fifth emarginated. Rectrices rather pointed with the pattern dusky white or white (*A. h. dabbeni*), and varying on the second outermost rectrix from a small spot or streak near the tip (*A. h. hellmayri*) to a narrow streak up the shaft in some specimens of *A. h. dabbeni* and *A. h. brasiliensis*. Measurements of 7 specimens : wing 71-80 : bill 14-15 : tail 46-57 : hind claw 10-13 : tarsus 22-24.

Zimmer recognizes three well-marked races ; *hellmayri* from the north-west ; the paler *dabbeni* from western Argentine and the Chile border, which migrates northwards in winter ; and the richer coloured *brasiliensis* from the east.

There are few records of *A. h. hellmayri* from Peru, and it therefore seems worth noting that there is a specimen in the British Museum collected at Capachica, Lake Titicaca, on 5th June 1937 by P. F. Holmes.

Anthus bogotensis

Confined to western South America from western Venezuela to north-western Argentine.

A medium sized pipit, heavily streaked above. Above, rich or light brown very heavily streaked on head, mantle, rump and tail coverts : below, light or orange buff, sparsely spotted on the upper breast and very sparsely streaked on the flanks. Hind claw medium to long, rather strong, and usually rather curved. The wing blunt, the first five primaries almost equal : the second to fifth emarginated. The tail pattern dusky usually restricted to a small spot or streak on the second outermost rectrix, but occasionally a narrow streak up the shaft. Measurements of 11 ♂ 15 ♀ : wing ♂ 80-86, ♀ 76-83 : bill ♂ ♀ 15-17 : tail ♂ 50-55, ♀ 49-55 : hind claw ♂ ♀ 9-17 : tarsus ♂ ♀ 23-25.

Zimmer recognizes four races on small differences of colour, pattern and size ; *A. b. meridae* from western Venezuela ; *A. b. bogotensis* from Colombia and Ecuador ; *A. b. immaculatus* from Peru ; and *A. b. shiptoni* from Bolivia and Argentine.

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Other specimens have been borrowed from the Academy of Natural Sciences, Philadelphia, the Chicago Natural History Museum, the Musée du Congo Belge, Tervuren, the Peabody Museum, Yale University, the Royal Scottish Museum, Edinburgh, and the Zoologisches Museum, Berlin. For these I am most grateful to the Directors of the institutes concerned.

SUMMARY

Five diagnostic characters have been selected to aid in the specific recognition of pipits: colour and pattern, size, the conformation of the hind claw, the tail pattern, and the wing formula.

Variation in these characters is discussed with reference as well to some peculiarities in moults of pipits.

The difficulties of subspecific definition and recognition are discussed in relation to migration, ecological variation and clinal variation.

The pipits of the world are divided into three groups under which their characters, ranges, geographical variation and identification are summarized with some notes on the relationship between certain species. Group A includes old world species which present difficulty in identification; these are discussed fully and illustrated in Plates 56-61; their measurements are listed for comparison in Tables 2-9. Group B, includes distinctive Old World and Australasian species, and Group C American and South Atlantic species: species in these groups are discussed less fully and not illustrated: the measurements of available specimens is included in the text.

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APPENDIX

Amendments proposed in this paper to the systematic list of Pipits in Check-List of Birds of the World, 9, 1960.

- Anthus novaeseelandiae ussuriensis*. Here recognized as a good race breeding in eastern Siberia, distinct from *A. n. sinensis* of south China.
- Anthus novaeseelandiae hoeschi*. Here considered as distinct from *A. n. bocagei*, and possibly will prove a good race allied to *A. n. twenarum* and *A. n. editus*.
- Anthus campestris griseus*. Here considered a synonym of *A. c. campestris*.
- Anthus campestris kastschenkoi*. Here considered a good race breeding between the Ob and Yenisei rivers, and wintering in India.
- Anthus similis schoutedeni*. Here considered a good race from the French Congo and Angola to the Kasai and Northern Rhodesia, distinct from *A. s. nyassae* of Nyasaland and Tanganyika.

Anthus vaalensis saphiroi and *A. v. goodsoni*. Here considered races of *Anthus leucophrys*.

Anthus trivialis sibirica. Here considered a good race breeding in Siberia, distinct from *A. t. trivialis* of Europe in series but not in individual specimens.

Anthus hodgsoni berezowskii. Here considered a synonym of *A. h. hodgsoni*.

Anthus spinoletta meinertzhageni. Here considered a part of a cline between *A. s. petrosus* and *A. s. kleinschmidtii*, but closer to the latter, and therefore best listed as a synonym of *A. s. kleinschmidtii*.

Anthus spinoletta blakistoni. Here considered a good race breeding in Central Asia, distinct from *A. s. coutelli* from the Caucasus.

Anthus spinoletta harmsi. Here considered as possibly indeterminate but best placed as a synonym of *A. s. japonicus* and not of *A. s. rubescens*.

Anthus spragueii. Here considered possibly as a race of *A. furcatus*.

Anthus sylvanus. The original author and reference should be :—

Heterura sylvana Hodgson, 1845, Proc. Zool. Soc. Lond. p. 33 : Nepal. *not*

Heterura sylvana Blyth, 1845, Journ. Asiat. Soc. Bengal, 14, p. 556 : Nepal.

Hodgson's description was published in August 1845 (see P.Z.S. 1893 : 438). Blyth's paper, in which he quotes Hodgson's description, must have been published after August, since it is in the same part (number 164) of the J.A.S.B. as a paper dated 29th August 1845 (p. 602). This gives priority, as is fitting, to Hodgson's description.



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PLATE 56
SOME ASIATIC PIPITS
Richard's Pipit

FIG. 1. *Anthus novaeseelandiae richardi*.

FIG. 2. *Anthus novaeseelandiae waiti*.

FIG. 3. *Anthus novaeseelandiae malayensis*.

Tawny Pipit

FIG. 4. *Anthus campestris campestris*.

FIG. 5. *Anthus campestris kastschenkoi* (young)

Blyth's Pipit

FIG. 6. *Anthus godlewskii*.

Long-billed Pipit

FIG. 7. *Anthus similis similis*.

FIG. 8. *Anthus similis jerdoni*.



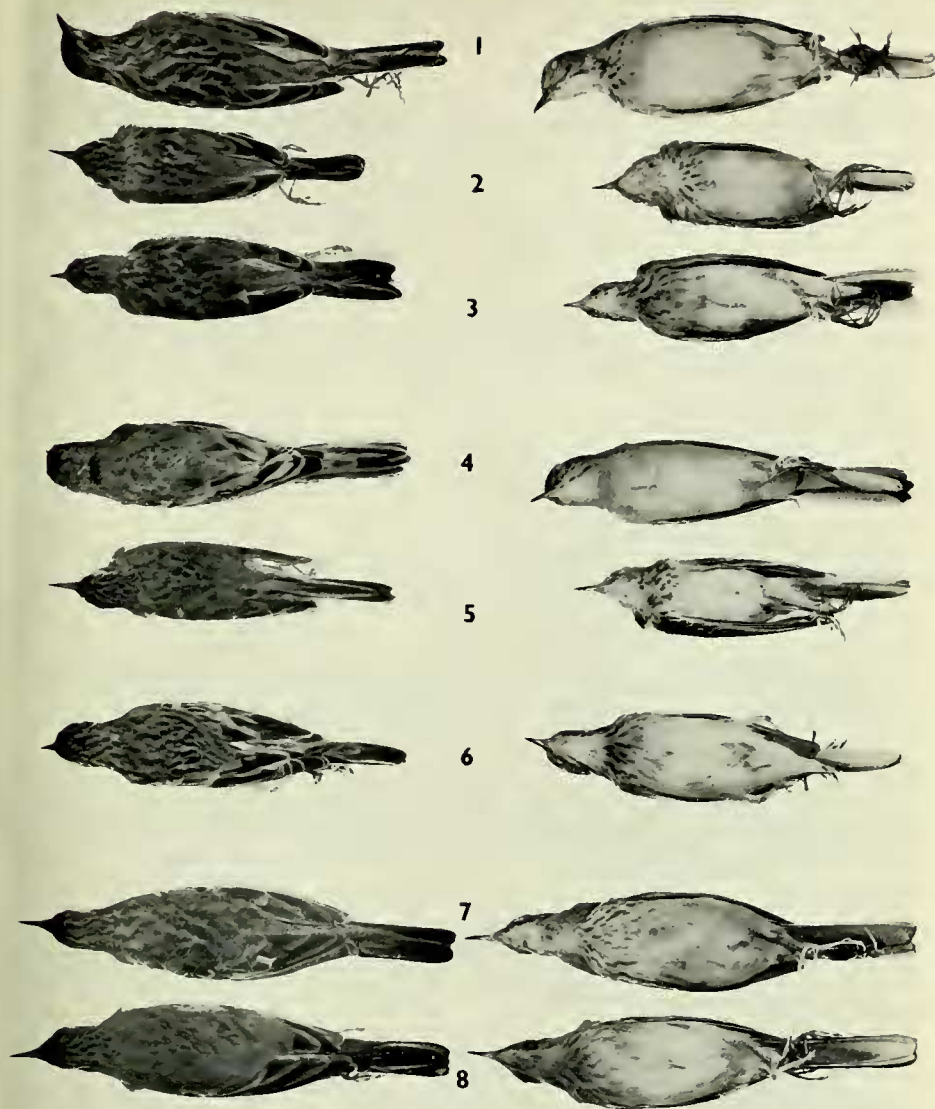


PLATE 57
SOME AFRICAN PIPITS
Richard's Pipit

FIG. 1. *Anthus novaeseelandiae cinnamomeus* (dark).

FIG. 2. *Anthus novaeseelandiae cinnamomeus* (normal).

FIG. 3. *Anthus novaeseelandiae bocagei*.

FIG. 4. *Anthus novaeseelandiae lwenarum*.

Long-billed Pipit

FIG. 5. *Anthus similis schoutedeni*.

FIG. 6. *Anthus similis nicholsoni*.

FIG. 7. *Anthus similis jebelmarrae*.

Plain-backed Pipits

FIG. 8. *Anthus leucophrys leucophrys*.

FIG. 9. *Anthus vaalensis vaalensis*.

FIG. 10. *Anthus pallidiventris pallidiventris*.



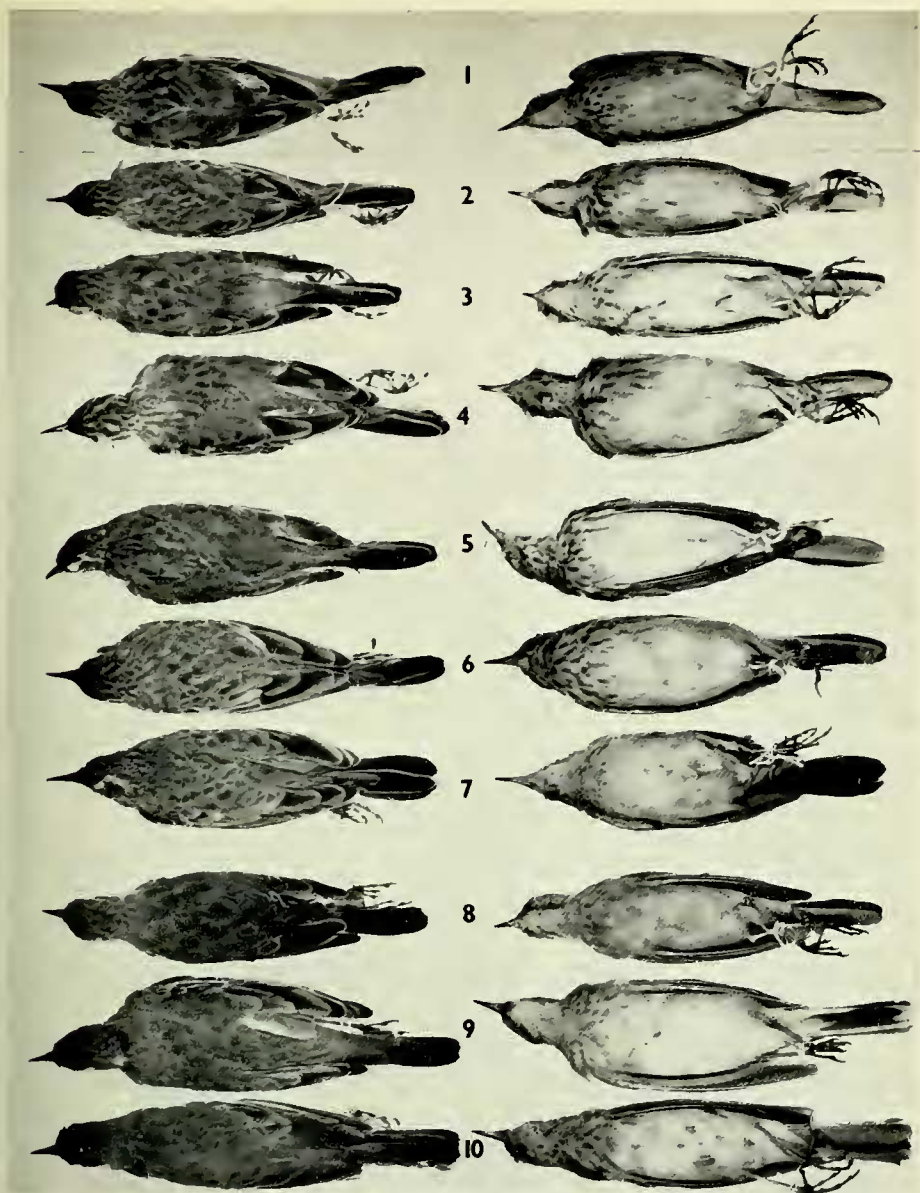


PLATE 58
SOME PALEARCTIC PIPITS

Meadow Pipit

FIG. 1. *Anthus pratensis pratensis*.

FIG. 2. *Anthus pratensis theresae*.

Tree Pipit

FIG. 3. *Anthus trivialis trivialis*.

FIG. 4. *Anthus trivialis haringtoni*.

Indian Tree Pipit

FIG. 5. *Anthus hodgsoni hodgsoni*.

FIG. 6. *Anthus hodgsoni yunnanensis*.

Hodgson's Pipit

FIG. 7. *Anthus roseatus* (autumn).

FIG. 8. *Anthus roseatus* (spring).

Red-throated Pipit

FIG. 9. *Anthus cervinus* (spring ♂).

FIG. 10. *Anthus cervinus* (autumn ♀).

Pechora Pipit

FIG. 11. *Anthus gustavi gustavi*.

FIG. 12. *Anthus gustavi menzbieri*.





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PLATE 59
SOME ROCK AND WATER PIPITS
Water Pipits

FIG. 1. *Anthus spinoletta spinoletta* (autumn).

FIG. 2. *Anthus spinoletta spinoletta* (spring).

FIG. 3. *Anthus spinoletta blakistoni* (autumn).

FIG. 4. *Anthus spinoletta blakistoni* (spring).

FIG. 5. *Anthus spinoletta japonicus* (autumn).

FIG. 6. *Anthus spinoletta japonicus* (spring).

Rock Pipits

FIG. 7. *Anthus spinoletta petrosus* (autumn).

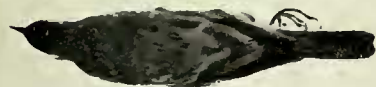
FIG. 8. *Anthus spinoletta petrosus* (spring).

FIG. 9. *Anthus spinoletta littoralis* (spring).

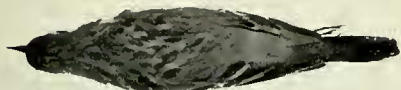




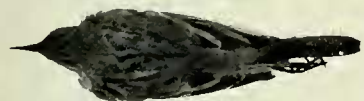
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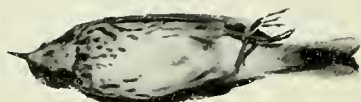
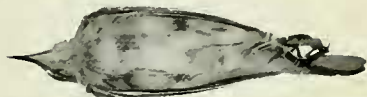
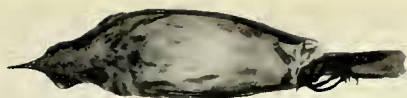


PLATE 60

Second outermost rectrices, wing tips and hind claws of Richard's Pipit (*A. novaeseelandiae*), the Tawny Pipit (*A. campestris*), Blyth's Pipit (*A. godlewskii*), the Long-tailed Pipit (*A. similis*), and the Plain-backed Pipits (*A. vaalensis*, *A. leucophrys* and *A. pallidiventris*).



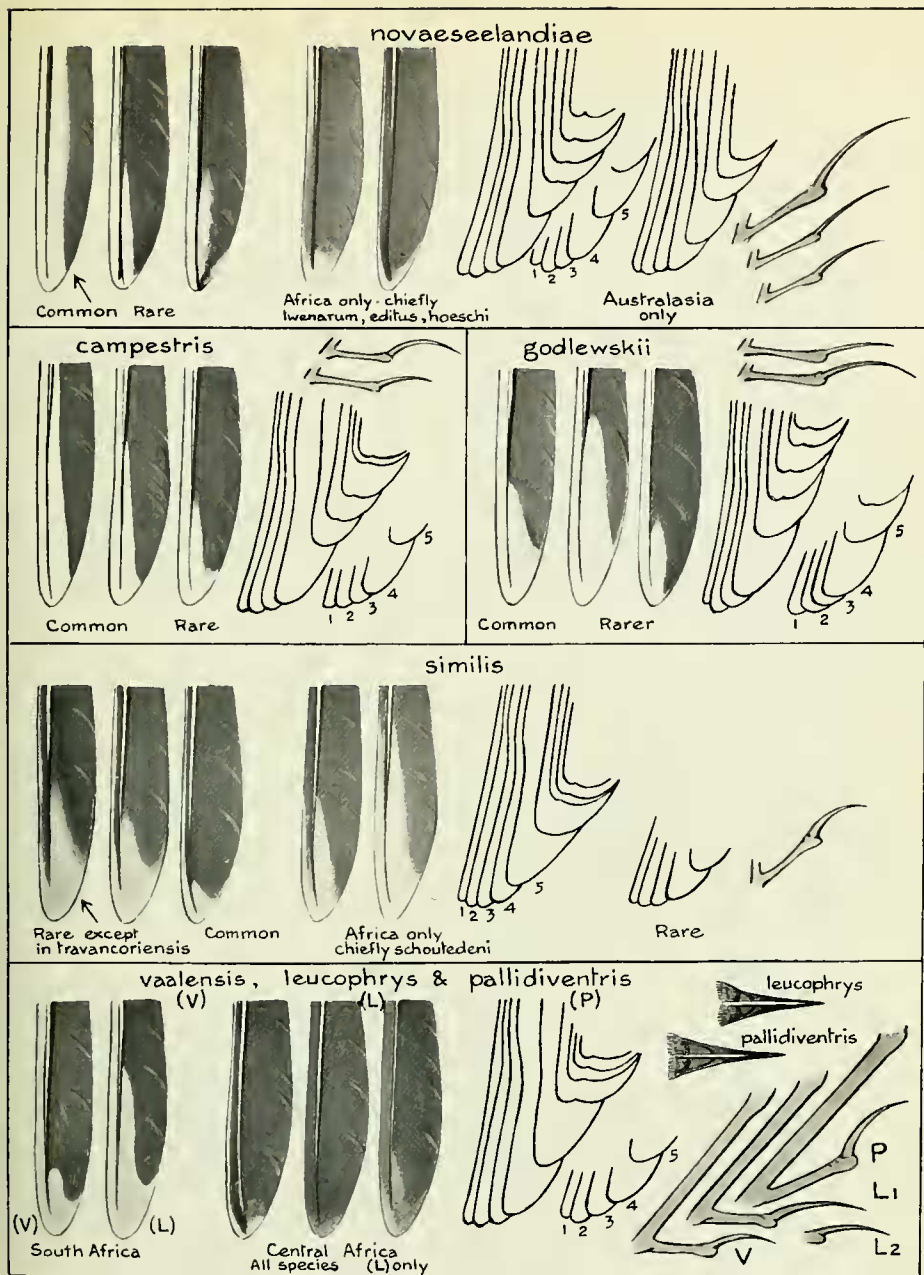


PLATE 61

Second outermost rectrices, wing tips and hind claws of the Meadow Pipit (*A. pratensis*), the Tree Pipit (*A. trivialis*), the Indian Tree Pipit (*A. hodgsoni*), Hodgson's Pipit (*A. roseatus*), the Red-throated Pipit (*A. cervinus*), the Pechora Pipit (*A. gustavi*), and the Rock and Water Pipits (*A. spinoletta*).

